

June 1948

TECHNOLOGY REVIEW

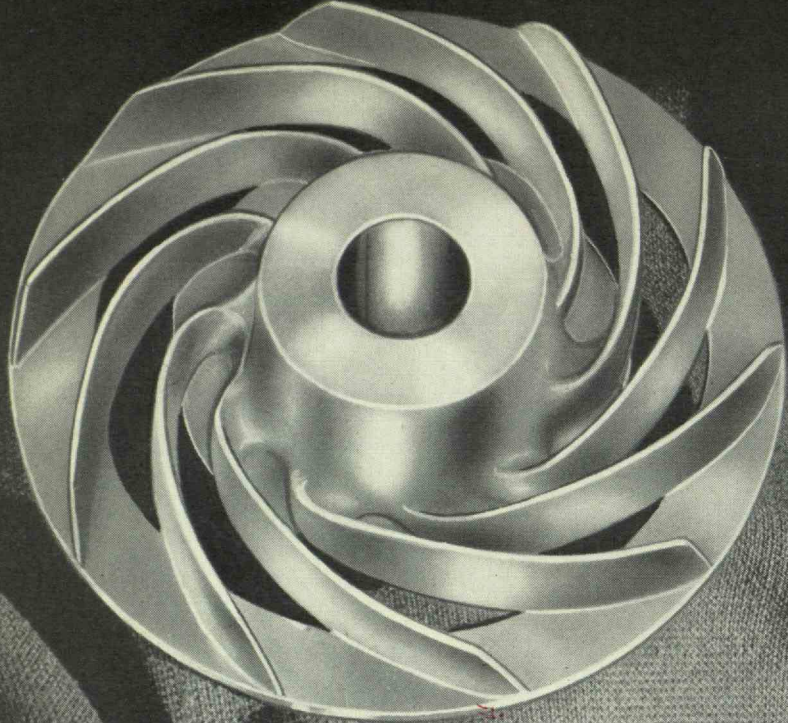
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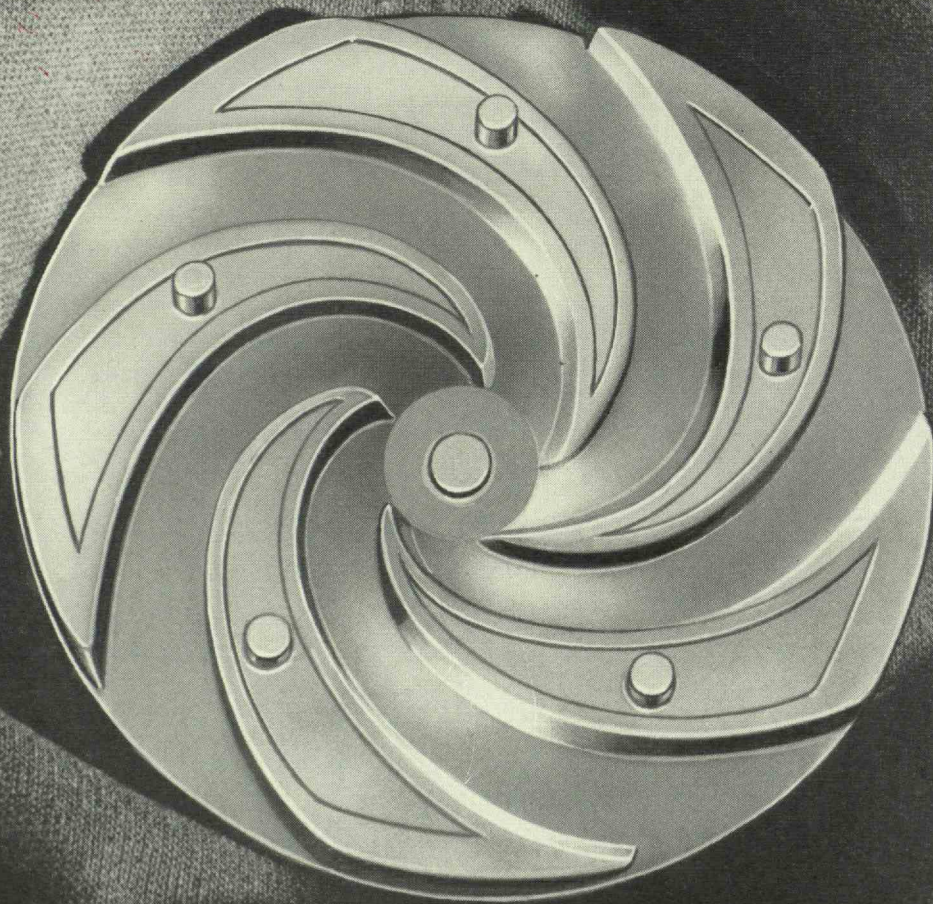
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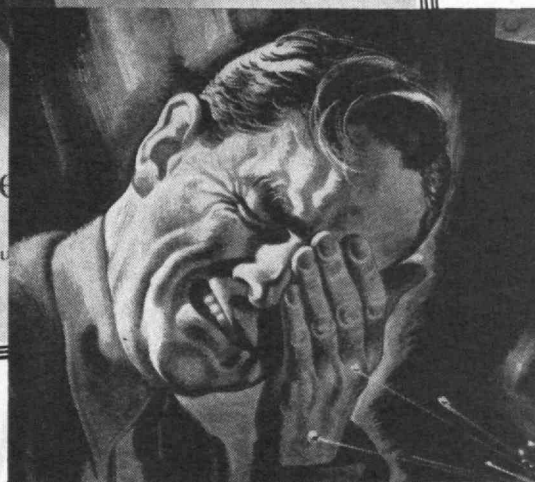
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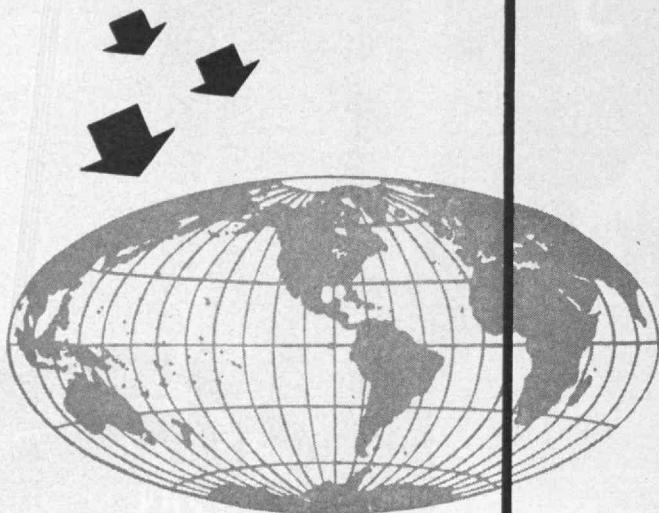
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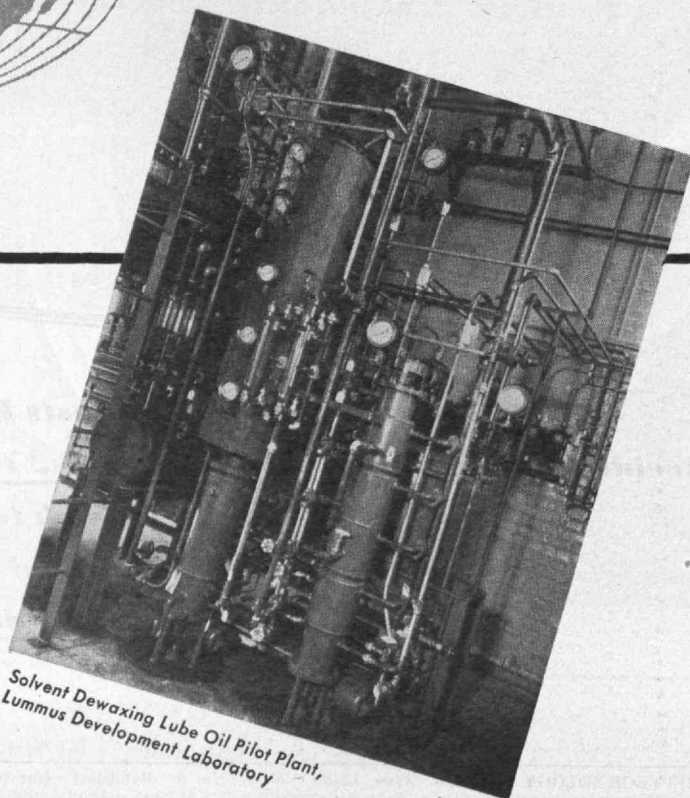
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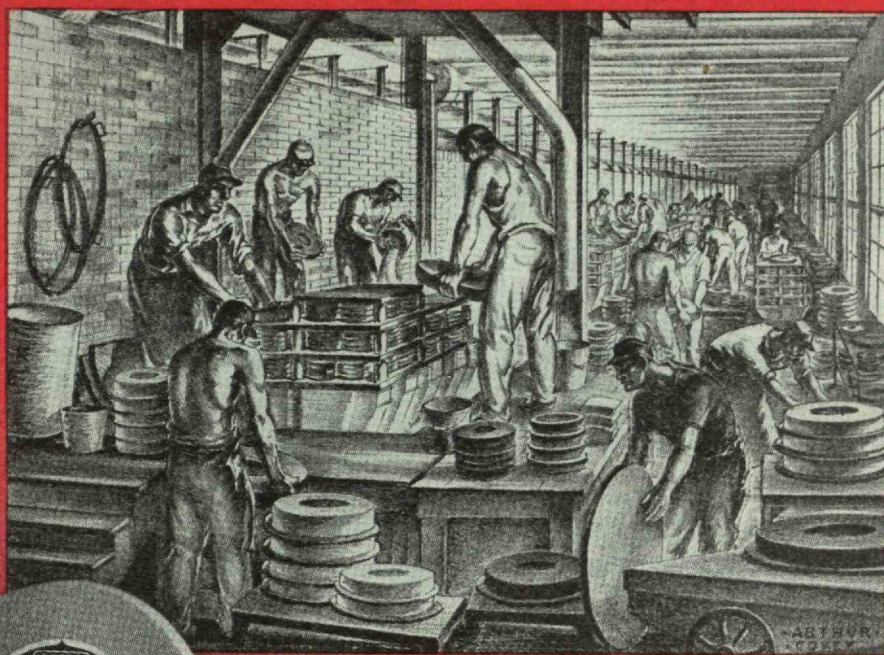
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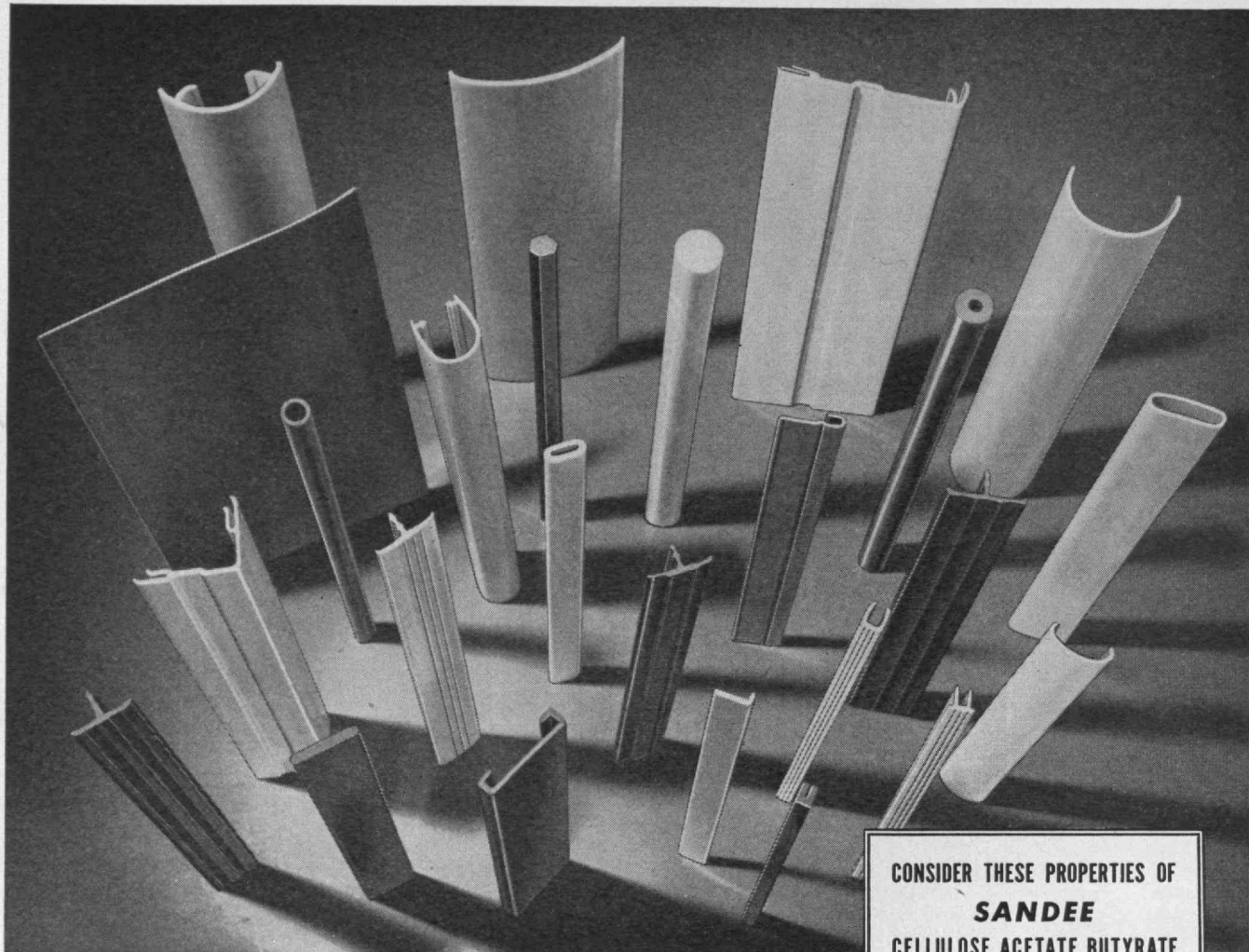
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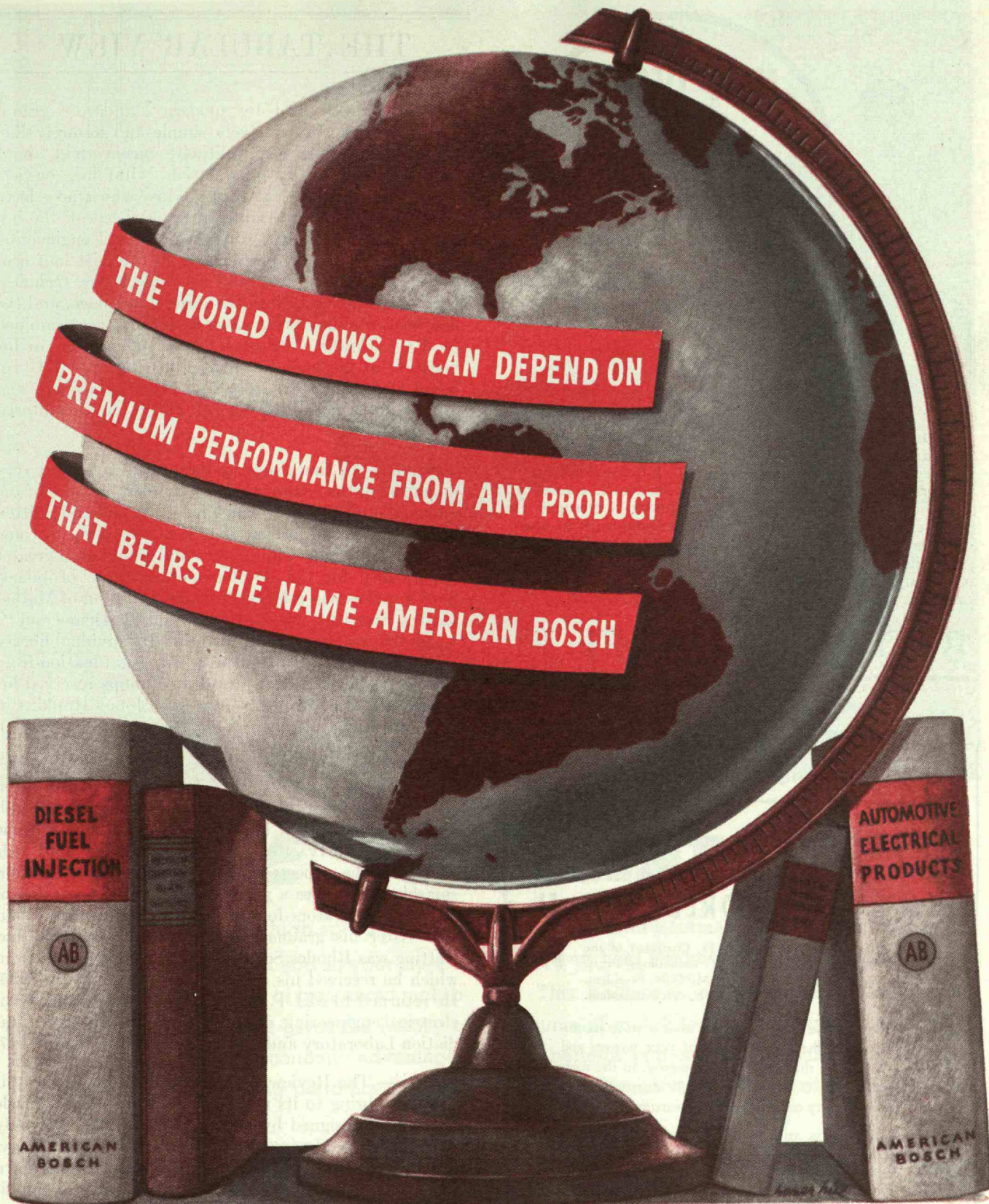
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Epilogue by J. R. KILLIAN, Vice President.

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May 1948

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THE TABULAR VIEW

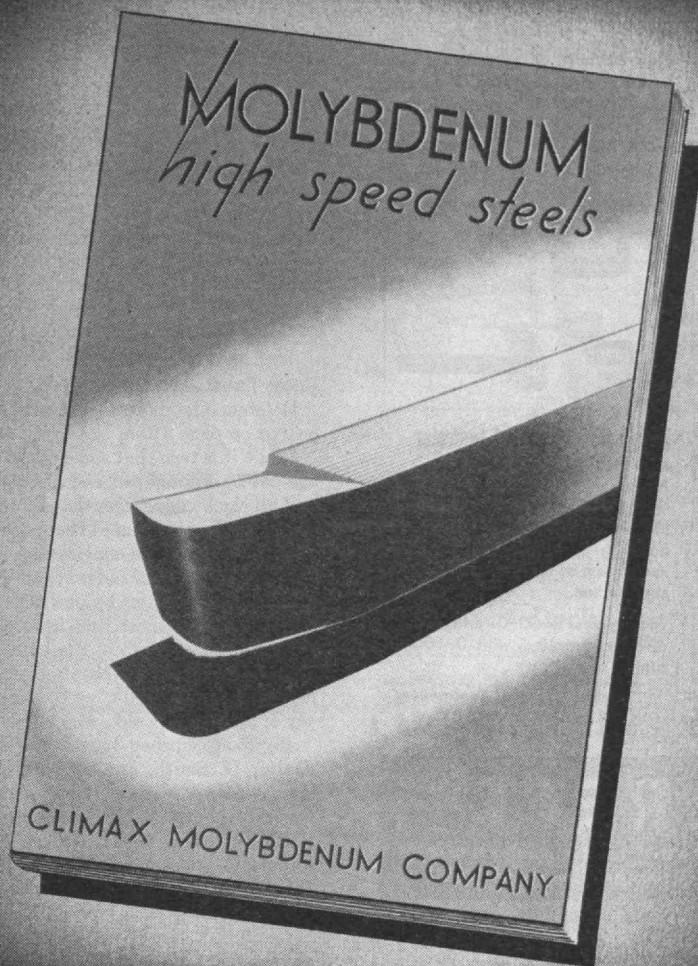
Glossology. — Judged by modern standards, grandfather lived a comparatively simple and leisurely life. He went his own way, blithely unconcerned about nucleonics, frequency modulation, vitamins, or jet-propelled airplanes. Yet these terms, which now have been injected into everyday language, bespeak the impact on our daily lives which science and engineering have brought about, particularly in the past half century. The ease and readiness with which new technical terms find their way into the general language, and the new concepts they bring along with them, are examined by PAUL COHEN, '35, (page 429). In addition to his vocation as mechanical engineer for the Sperry Gyroscope Company, Mr. Cohen wields an able pen, and rounds out a decade as one of The Review's editorial associates.

Revered. — In times such as the present, we need very much less of the common man and infinitely more of the uncommon man. Yet so much has been said and written in support of the former, that it is refreshing to come upon a spokesman who reveres and would give greater opportunity for the development of those of talent. Such a spokesman is H. B. PHILLIPS, Professor of Mathematics, Emeritus, whose article "What Is Democracy?" (page 433) emphasizes self-disciplined, individual liberty as the basis of a true democracy. After graduation from Erskine College in 1900, Professor Phillips received his degree of doctor of philosophy from Johns Hopkins in 1905. He was a member of the Department of Mathematics from 1907 until 1947, and its head for 12 years.

Accelerators. — Atoms have been chipped and even split, but the forces holding the nucleus together are still one of nature's best kept secrets. "Artificial Cosmic Radiation" by IVAN A. GETTING, '33, (page 435) tells what may be expected from recent research in atom smashing and gives a good account of the operation of cyclical accelerators for speeding up elementary particles. After his graduation from M.I.T. in 1933, Dr. Getting was Rhodes Scholar at Oxford University from which he received his doctorate of philosophy in 1935. He returned to M.I.T. in 1945 as associate professor of electrical engineering, after heading a division of the Radiation Laboratory and became a full professor in 1947.

Puzzle. — The Review runs a bit out of character this month to bring to its readers a novel crossword puzzle (page 444) designed by JOHN M. KECK, '23. Not only is this pastime devised by an alumnus of Technology, but the diagram itself contains many terms well known to M.I.T. students. Its design contains several significant symbols which all engineers will recognize.

Hobby. — Believing that all work (for which it is well known) and no play makes Jack a dull boy, the Institute inaugurated a student Hobby Shop in 1937. Now revitalized after World War II, the important part which this activity plays in student activities is recounted (page 441) by ISAAY STEMPNITZKY, 6-45, who is completing his studies for a doctorate in mathematics. Mr. Stempnitzky has been foreman of Hobby Shop.



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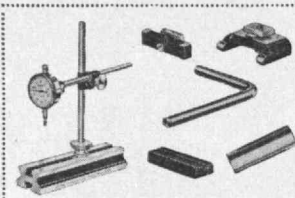
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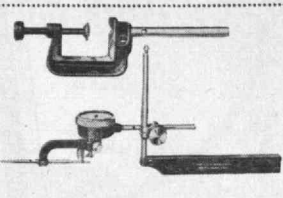


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Approbation

FROM F. P. HANKERSON:

It was with great interest that we read the article "Roll out the Barrel" in the Trend of Affairs section of the April, 1948, issue of The Review. It was most excellent.

We would indeed like your permission to republish this, giving due credit to The Review and to the author.

Editor, The Wooden Barrel
St. Louis 2, Mo.

And Disapprobation

FROM THOMAS D. PERRY, '00:

Reference is made to the article "Roll out the Barrel" which appeared on page 310 of the April, 1948, Review.

While it is true that some of the present-day barrels are made by the age-old traditional process, especially the cheaper types for oils, paints, and all slack cooperage, that is only part of the story.

Plywood, or laminated beer barrels were developed some 10 years ago, in which I had some considerable part, and much better service can be obtained than in the older types. The staves are twice as wide, reducing leakage potentialities by one half; the frequent rupture of the wood on the bilge, where bent, has been eliminated entirely; and there is adequate in the strength of the bung stave. Oak is used for the inner and outer layers of the seven-ply stave, with cheaper woods for the central layers. This plywood construction has done much to conserve the supply of prime white oak, which is so much prized for barrel manufacture.

Plywood bourbon barrels are in the course of development under Arthur D. Smith, Jr., '23, and have passed excellent strength tests. Their ability to properly age spirituous liquors is under test, so far favorable, but not to be completed for a couple of years more.

It is to be regretted that the editorial staff of The Review missed this important phase in barrel development that has been presented before the American Society of Mechanical Engineers and published in many trade journals. It is not my desire to increase the thorniness of the editor's bed, but the cooperage industry deserves credit for its alert development along modern and efficient lines. You have inadvertently made this industry appear to be unaware of modern progress, which is quite undeserved.

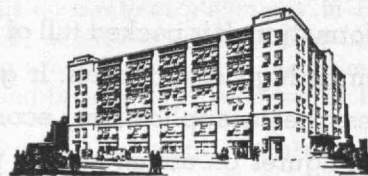
Moorestown, N. J.

On Conservation

FROM MARSHALL N. WATERMAN, '24:

I think the articles on conservation by Dr. Ira N. Gabrielson which appeared in the January and February, 1948, issues of The Review were most worthwhile and interesting. The Review continues to be excellent. New York 21, N. Y.

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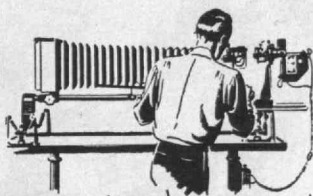
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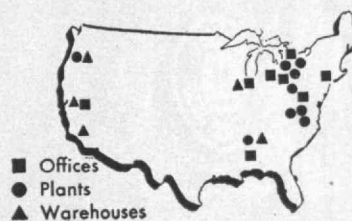


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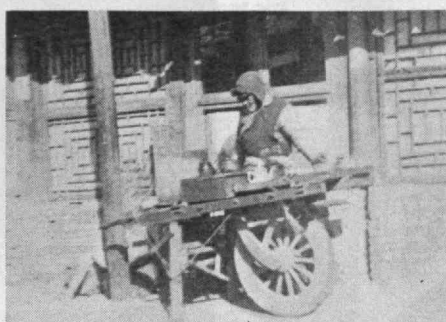
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Paul McC. Wiswall, '09

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J. F. Bennett

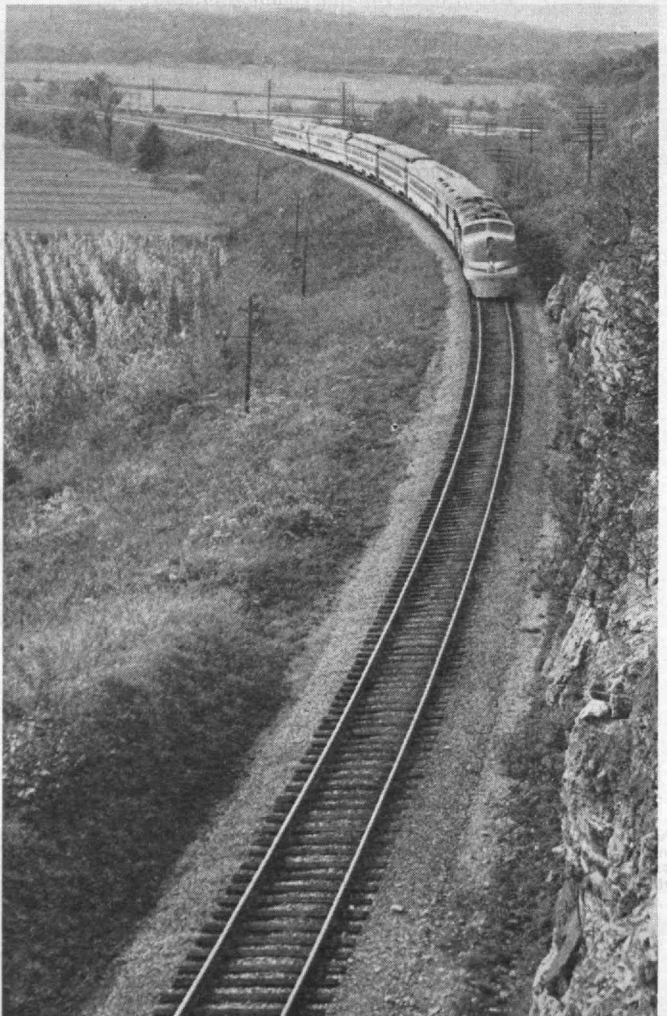
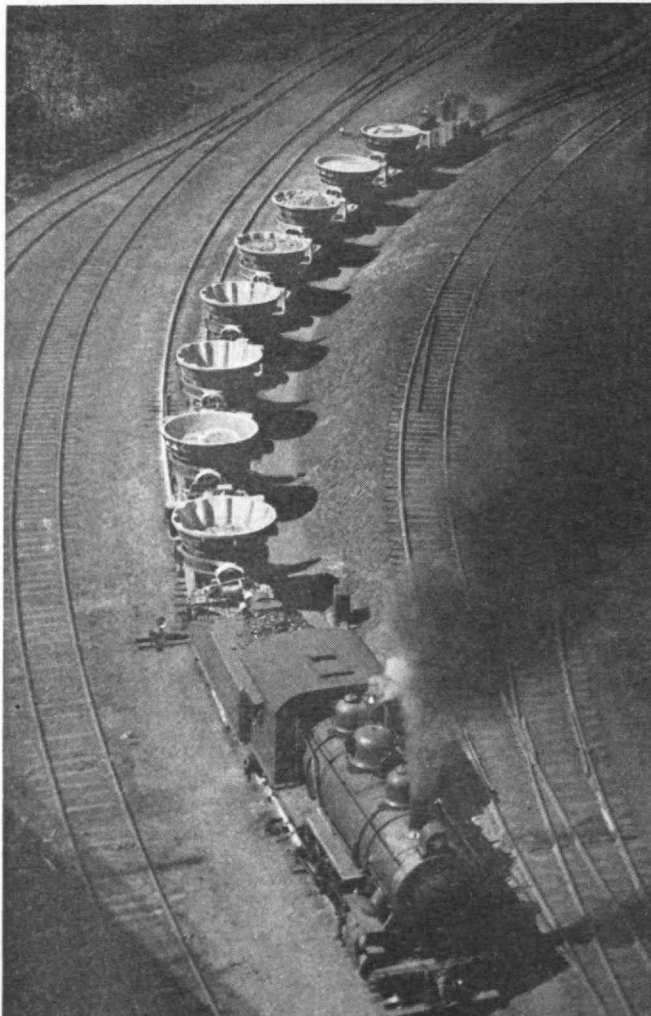


Paul R. Cunliffe

Steel Rails across the Continent

Henry M. Mayer from Black Star

Paul E. Nentwig



THE TECHNOLOGY REVIEW

Vol. 50, No. 8



June, 1948

The Trend of Affairs

Butcher Viewpoint

THE common assumption that well-fed individuals are healthier does not hold true categorically when examined in the light of recent research. Undernutrition has, in fact, been found to increase resistance to infection of a certain type, although it does decrease resistance to other types of infection. Furthermore, restriction of food intake has been found to lengthen the life span. All of this research was done with small animals; the impossibility of exposing human beings to the experimental conditions required in such studies is obvious. Likewise, the extended normal life span of man makes difficult evaluation of influences affecting life span.

It is true that lowering the levels of certain vitamins below amounts considered to be optimal has been found to increase susceptibility to particular microbial diseases. For example, a shortage of the member of the vitamin B complex, known as biotin, increased susceptibility to paratyphoid infection, and also to malarial infection. Undernutrition likewise was shown to increase susceptibility to intestinal parasites, but in this study, lowered resistance was judged to be due to a general debilitation of the host, rather than to lack of specific dietary factors.

In complete contrast, however, deficiency of thiamine, vitamin B₁, was shown to increase resistance to a virus infection, poliomyelitis. Reduced intakes of minerals, considered to be dietary essentials, also improved resistance to a different virus. But these findings do not contradict the reverse observations with regard to the diseases mentioned in the previous paragraph, because of the differing nature of the respective etiological agents. The organisms causing paratyphoid infection are bacteria, microscopic plants; malarial parasites are microscopic animals; intestinal parasites are multicellular animals; viruses are submicroscopic entities not endowed with life in the sense we commonly recognize. The mechanisms of infection by, and resistance to, these different types of disease-producing agents may differ widely.

Hence there is no reason to expect these mechanisms to respond similarly to undernutrition.

Nevertheless, the findings with regard to virus infections are striking in that they indicate undernourished organisms may have superior resistance to this important class of diseases. Explanations suggested for this relationship have been purely theoretical; a likely one postulates that parasitism of viruses upon the cells of the host may be so intimate that the virus is attracted only to well-nourished cells.

The diets used to study effect of undernutrition upon longevity were complete qualitatively in that they provided the "protective" factors, such as vitamins and minerals, in amounts known to be needed. But the diets were restricted quantitatively, by limiting total calories, or food-energy units. This limitation was accomplished in one of two ways: either by a continuous restriction of the amount of food supplied to the animals or else by alternating periods of free feeding with periods of total withholding of food. Continuous food restriction stunted growth of the animals; intermittent fasting did not.

Both types of food restriction produced significant lengthening of the life span, as compared with length of life of control animals that had been allowed to feed freely at all times. Therefore the available evidence on effect of feeding upon length of life is all in favor of restricted food intake, even when food limitation was carried to the extent of stunting growth.

At this point it must be stressed again that the observations summarized above were made on small animals. Therefore they are not necessarily directly transferable to human beings. Nevertheless, the findings indicate that undernutrition may have salutary effects, and in more than one direction. Hence the customary "butcher viewpoint" of aiming food habits toward abundance, with production of rapid growth and maximum body size, is not necessarily conducive to optimal well-being and a long life, and requires careful re-evaluation in the light of available and future research in this field.

Apothegms of Science

MUCH of the philosophy of science has been expressed epigrammatically by scientists with a literary bent, or by men of letters possessing a certain scientific insight. Thus a quotation from Thomas H. Huxley often seen in abridged form reads in full as follows: "Science is nothing but trained and organized common sense, differing from the latter only as a veteran may differ from a raw recruit: and its methods differ from those of common sense only as far as the guardsman's cut and thrust differ from the manner in which a savage wields his club." In the same vein George Santayana wrote: "Science is nothing but developed perception, interpreted intent, common sense rounded out and minutely articulated." "Science is a first rate piece of furniture for a man's upper chamber," said Oliver Wendell Holmes in characteristic phraseology, "if he has common sense on the ground floor." This cardinal faculty of scientists was characterized by Alexander Pope thus:

"Good sense, which only is the gift of Heaven,
And though no science, fairly worth the seven."

Pope, a prolific writer of philosophic verse, heralded the age of technical specialization in these lines:

"One science only will one genius fit;
So vast is art, so narrow human wit."

"Specialism, now a necessity," warned William Osler, "has fragmented the specialties themselves in a way that makes the outlook hazardous. The workers lose all sense of proportion in a maze of minutiae."

The advice of Edward Bulwer Lytton to those who seek to learn by reading was: "In science, read, by preference, the newest works; in literature, the oldest." "Books must follow sciences," runs the classic quotation from Francis Bacon, "and not sciences books." Pope, always quotable, rhymed in this fashion about rote learning in the sciences:

"How index-learning turns no student pale,
Yet holds the eel of science by the tail."

Another fundamental tenet of the scientific approach set down by Francis Bacon is: "Whatever the mind seizes upon with peculiar satisfaction is to be held in suspicion." A primary aim of research was articulated by W. S. Jevons thus: "Science arises from the discovery of identity amidst diversity." "Man cannot make principles," said Thomas Paine, "he can only discover them." Walter B. Cannon pointed up the influence of words on thought, and at the same time epitomized the present limitations of the biological sciences, when he wrote: "In a biological system all the elements of which cannot be known, the words 'must,' 'absolutely,' 'doubtless,' and 'invariably' should be used not at all or with extreme caution."

William Temple indicated a prime basis of scientific motivation by stating: "Science has its being in a perpetual mental restlessness." "It is not the *possession* of knowledge, of irrefutable truths, that constitutes the man of science," Karl Popper wrote, "but the disinterested, insistent *search* for truth."

An adage with technical import, so timeworn that the identity of its author has been buried in the mists of antiquity, is: "The exception proves the rule." Although this aphorism is widely quoted today, it is usually misinterpreted; for it is a direct translation of the Latin *exceptio probat regulam*, so that "proves" here means

"tests." The same meaning of prove is to be found in a quotation from Paul, the Apostle, that incidentally is a good maxim of the scientific point of view: "Prove all things; hold fast that which is good."

Selection for Resistance

THE struggle for existence," said Spencer, "leads to the survival of the fittest." Among the odder consequences of that principle have been a series of hidden and almost unknown defeats in our battle against our insect and bacterial enemies. An illustration is the increasing number of reports that many strains of microorganisms are developing resistance to penicillin and streptomycin, just as others did a few years ago to the sulfa drugs. In fact, starting with cultures of meningococcus which succumbed readily to streptomycin, scientists have been able to isolate strains which "actually required streptomycin for growth and multiplied best in high concentrations of the drug." Like the man who "recovered of the bite — the dog it was that died," when mice were infected with this particular variety of microorganism, the untreated mice managed fairly well; the ones treated with the antibiotic succumbed. The ability to become tolerant of antibiotics has, unfortunately, been noticed with a wide range of microbe species and genera.

All this is no disparagement of chemotherapy and of the many antibiotics which have been investigated during the past decade. But it does mean that there is danger in using these powerful new drugs on trivial illnesses or in concentrations insufficient to deliver a knockout blow to the invading organisms. It implies also that highly resistant strains of important diseases may become prevalent enough to reduce the value of present antibiotics to the physician. On the other hand, chemists have been busy uncovering many new varieties of penicillin and streptomycin, and will very likely find ways of altering the structure of naturally produced types in a manner that will evade the defenses being created by the disease germs. But as long as living tissue retains its capacity to adapt itself to hostile environments, the unveiling of a new and powerful drug will be no guarantee that a specific disease has been permanently conquered.

Doubts are even beginning to arise about DDT. The discovery of powerful new insecticides, particularly DDT, has raised the hope that large-scale control of some of our more serious insect pests will now be feasible. It has been suggested, for example, that huge tropical areas, previously graveyards because of insect-borne diseases, may be opened to successful colonization by the use of these chemicals. Although the dream may in time prove true, the insects are not co-operating. Unless dosage of an insecticide is extremely heavy and thorough, there are generally a few survivors in a treated area. It has been demonstrated that these survivors can become the ancestors of lines a great deal more resistant than was the original population. Worse still, for man's point of view, those who withstand one poison show a tendency to increase the extent of their immunity to many others.

The Bureau of Entomology and Plant Quarantine, working with funds supplied by the Office of the Surgeon General, United States Army, took the 10 per cent of house flies that had survived a measured application of DDT and bred from them a special colony. Each generation in turn was similarly (Concluded on page 450)

The Shadows of Science

BY PAUL COHEN



A. Devaney, Inc.

"Men ever had, and ever will have, leave to coin new words well suited to the age."

Translation of Horace's *Ars Poetica* by
Wentworth Dillon, Earl of Roscommon

THE impact of science on civilization, its huge and growing presence in our everyday lives, is a theme which, by its sheer immensity and complication, has smothered most of the authors who have attempted to deal with the subject. In turn, it has been beaten to death by repetition. But if the substance cannot readily be pictured, the shadow may perhaps suggest the image.

Accompanying every event or thing that intrudes upon our consciousness is a word; for words are the symbols with which our minds are related to the external world. It is a measure of the growth of science, therefore, that words of technical and scientific origin, which once entered the common tongue one by one and at irregular intervals, are now marching into the layman's language by squads. New arts, new mechanisms, new concepts too important (and too disturbing) to be ignored by any but the most obtuse, are forcing their way into our lives; their shadows appear on the tongue and in the literature of the common man.

The problem is universal. For example, in translating the charter of the United Nations into Chinese, it was necessary to devise almost 2,000 new combinations of ideographs. The standard Chinese dictionary, compiled under imperial supervision during the Eighteenth Century, appears to have overlooked some of the semantic problems of the atomic age. Scientific terms are among the biggest stumbling blocks in languages other than

Chinese, and an atomic energy glossary has been prepared in the five official languages of the United Nations.

Considering only publications of general circulation, we find in them today scores of words which, although widely understood and used without explanation or apology, are of the most recondite origin. Women's journals discuss antibiotics, such as penicillin and streptomycin, with the other side of the page, as likely as not, devoted to the virtues of detergents in washing machines. Records are broken as jet- and rocket-propelled airplanes travel at supersonic speed, sometimes through the stratosphere. Geneticists report new and startling mutations produced by x-rays, neutron beams, and other man-made radiations. Television programs travel between stations along coaxial lines and are received in the home by sets that receive amplitude- or frequency-modulated radio waves with equal ease. Oddest of all is that millions of laymen can plow through such text without reaching for a dictionary. It's just as well, too, for the dictionaries would frequently fail them.

Radar now appears in the news in connection with the towing of barges across New York harbor in foggy weather, guiding commercial planes on which we have been (or might be) passengers, or signaling to such a piece of public property as the moon. But the term, which was coined by the United States Navy as an abbreviation for the phrase "radio detection and ranging," was presumably completely unknown even to the technical world (aside from those directly concerned with it) until April 25, 1943, when the first Army-Navy press release on that subject was issued.*¹ Two lesser known cousins of radar that seem due to remain in civilian life are loran and sonar. The former is an abbreviation of the phrase "long range aid to navigation," and the latter term, coined at Harvard University to describe a "sound navigation and ranging" device it had developed, was promptly applied by the Navy to all underwater sound gear.

World War II left another significant phrase with us — guided missile. Actually it is the name and not the device which is new. Weapons whose paths are automatically controlled after launching are at least as old as the Whitehead torpedo.† Radio controlled or "drone" planes

* See bibliography at end of article for numbered references.

† Torpedo, meaning the electric eel or ray, and derived from the Latin *torpere*, stiff or numb, entered our language about 1520. As a noun, meaning a submarine missile or mine, it has been in use since our Revolutionary War. With the invention of the Whitehead torpedo, which made it an automatically steered, self-propelled device, it became a far more significant weapon, and by 1879 we had the verb "to torpedo," meaning to destroy or damage with such a missile. But the word has continued to progress. Witness such usage² as the New York Times headline "Moscow Says U. S. Torpedoes Parley." In a way, the torpedo has been the foster mother of the word servomotor, for one of the first servo or "slave" mechanisms to be used was the little pneumatic engine that amplified the signals from the torpedo's controls into a force that could move the rudders.

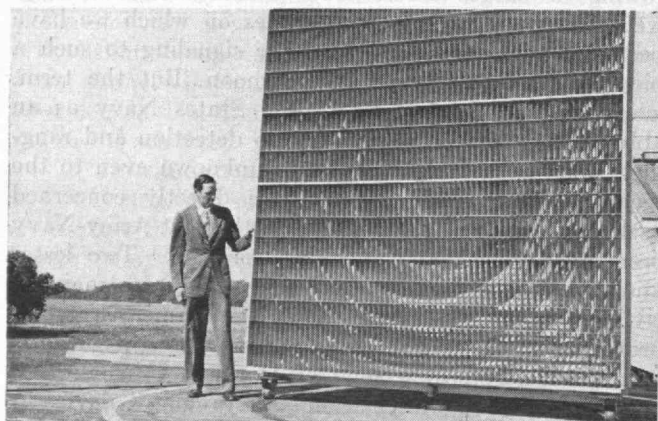
were experimented with during World War I. But the first use of a radio-controlled missile in combat (by the Germans) is said to have occurred during 1943, and only with the steady pounding of London, and later Antwerp, by the V-1's and V-2's did the public realize the nature of this new threat to life and property. The guided missile will very likely also cause important tactical changes on the battlefield, but it is the long-range missile aimed at a metropolitan area that grips the general imagination.

King of the guided missiles, as of the moment, is the V-2; and stark as is this designation, it calls up a sharp, detailed picture in the mind of almost every person who sees a movie or reads a newspaper regularly. ‡ Mainly because the V-2 has been making well-publicized trips



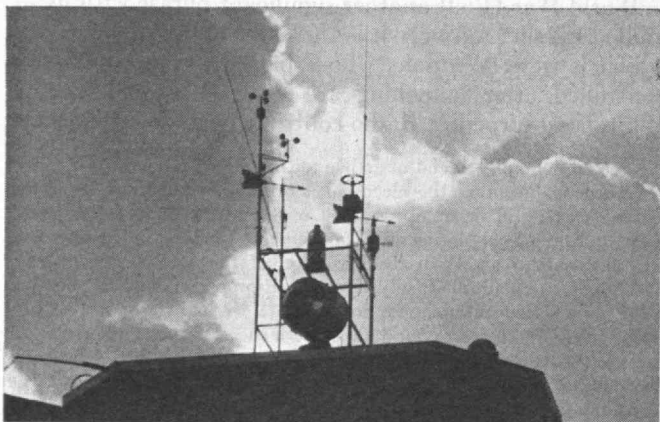
Boeing Aircraft Company

▲ Jet Propulsion



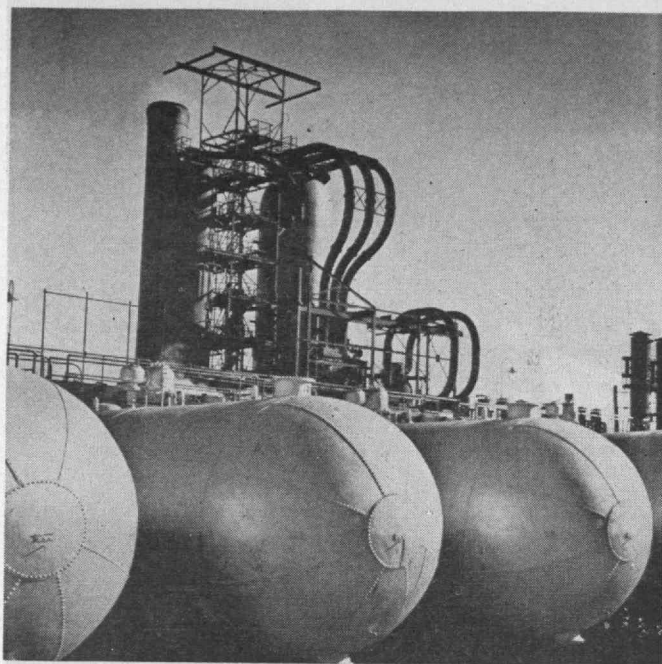
Bell Telephone Laboratories

▲ Microwaves



Samuel Kravitt

▲ Meteorology



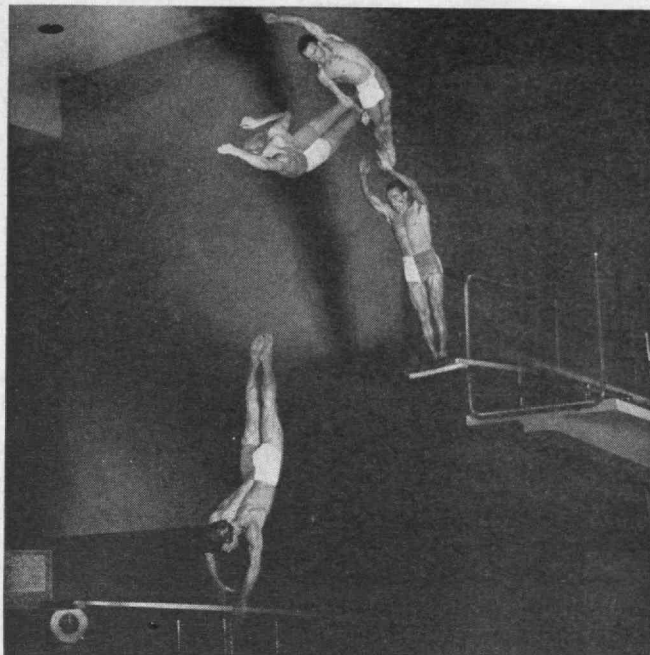
Robert Yarnell Ritchie

Petroleum ▲

deep into the ionosphere, the outermost shell of our atmosphere, the Sunday supplements have broken out with a rash of terms that were once the sole concern of meteorologists and physicists. The ionosphere is so called because it contains many layers heavily charged with ionized particles which, fortunately, are excellent reflectors of radio waves and make long-range, short-wave radio communication possible. Far below is the troposphere, the shell of air immediately in contact with the earth and extending to a height of approximately five to 10 miles. *Tropo* means turn or change, and the region of the troposphere is indeed one of varying temperatures and wind velocities, of storms, calms, and clouds. Above the troposphere lies the stratosphere, entered occasionally by the higher flying of our planes and extending to about 50 miles above sea level. The stratosphere was so named about 40 years ago because (and this is the definition still current in our dictionaries) it was thought to be of nearly constant temperature throughout its thickness. Recent investigations, and particularly the V-2 flights, have dispelled that illusion, and we have one more scientific term with a derivation no longer with its original meaning.³

Vitamine, now spelled vitamin, is another example. It was coined by Casimir Funk in 1912 from the Latin *vita*, meaning life, and the chemical term *amine*, which is an organic derivative of ammonia, since he thought that the vitamins were all amines. They are, of course, of a far more varied structure. There is also the dinosaur, which Sir Richard Owen thought was a single species (happily extinct) of large and savage lizards. He therefore combined the Greek words *deinos* or terrible, and *sauros* or lizard.⁴ That was in 1841 and 17 years before Darwin published *The Origin of Species*. In the intervening century, however, the paleontologists have been busily disinterring dinosaurs by the hundreds, and it is now apparent that many of them were small; some were very likely timid in disposition, and none of them was truly a

‡ Undoubtedly the term is not for the dictionaries. How can a properly reared lexicographer have dealings with a word that is a cross between a capital letter and an arabic numeral?



Edgerton, Germeshausen, and Grier

▲ High-Speed Photography

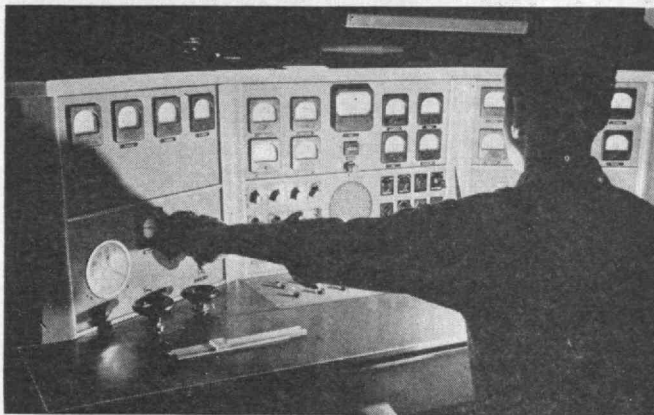
lizard. Today the word dinosaur is no more specific than the phrase "hoofed animals." It is simply a way of referring to several related orders of extinct reptiles.

From time to time the scientists have succeeded in creating phrases as impregnated with drama, mystery, and adventure as any in the language, and the sonic barrier, the wall of sound, must fall into this category. The speed of sound was interesting scientists in Newton's time, for Sir Isaac⁵ derived an equation (incorrect) for determining it. But it became a subject for newspaper discussion just before the outbreak of World War II, as an item in the debate on whether it would ever be possible for a plane to push through the air at velocities greater than that at which sound is propagated. Then, as propeller-driven fighter planes increased in speed, they began to get into trouble, sometimes with fatal consequences, as they approached the speed of sound in power dives. With the revitalization of rocket and jet propulsion, assaults on the sonic barrier in man-carrying planes have increased in frequency and interest.

It is fairly well known, of course, that the word rocket is of considerable antiquity. It entered the language about 1611, and is derived from still older French and Italian terms. The French *roquette* (a colewort) and the Italian *rocchetta* (bobbin or spool) which, in turn, is a diminutive of the Italian *rocca* (distaff) all have reference to the shape of early fireworks rockets. Jet propulsion⁶ is a little more up to date. Not until 1866 did the British Admiralty build a ship of 1160 tons, propelled by a water jet (based on a patent 17 years older), to see if it was any more efficient a method than propellers. (It wasn't.) The word "jet," meaning to spout or spurt forth, dates from 1692, and as applied to an emission of fluid from an orifice, has been in use since 1696.

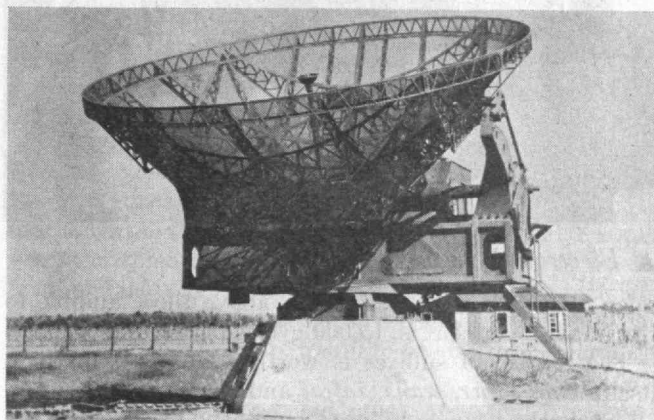
Careful distinction is now made between subsonic, transonic, and supersonic flight, for the manner in which the air flows around a body in each of these zones is radically different, and the point at which the flow changes depends not so much on the speed in miles per hour as on its relationship to the speed of sound in the

immediate vicinity. While there are no sharp, clean-cut physical changes to mark the transitions, the subsonic range is generally considered to include speeds up to about 0.8 the speed of sound. The transonic region extends from 0.8 to about 1.2 times the speed of sound, and thereafter is the realm of the supersonic. Transonic seems to be a fairly new term, for only with the airplane is the sonic barrier approached and penetrated rather slowly. With shells and rockets, which achieved supersonic speed (that greater than the speed of propagation of sound) very quickly, there was little occasion to study the unsteady and somewhat inexplicable flow phenomena of the transonic region. The word supersonic, on the other hand, is close to 30 years old, and appears to have been appropriated, with new meaning, by the airmen from the physicists, for supersonic and ultrasonic both

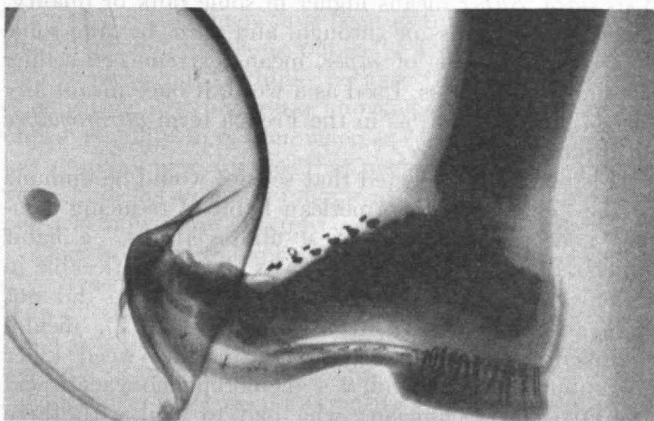


A. Wittman from Black Star

Nuclear Physics ▲



Radar ▲



Westinghouse

High-Speed Radiography ▲

▼ Crystallography

F. S. Lincoln, '22



George H. Davis Studio

▲ Electron Microscopy

refer to sounds with frequencies above those audible to the human ear, that is, 15,000 cycles per second or more.

The matter of suffixes is worth a little attention in itself. *Sub*, *super*, *trans*, *infra*, and *ultra* are, of course, all of Latin origin. As used currently in English, *sub* means under, below, at the bottom of. So, essentially, does *infra*. *Super* means higher in some rank or quality. *Trans* means across or through, and *ultra*, bearing some of the connotations of *super*, means extreme, exceeding the limits of its class. Used as a word, it once meant any sort of an extremist, as in the French term *ultraroyaliste* or *ultrarévolutionnaire*.

It is not to be expected that science would be immune to the "characteristic American habit of reducing complex concepts to the starkest abbreviations," a habit which Mencken points out⁷ "was already noticeable in Colonial times . . ." Fortunately, the public did not have to put up with trinitrotoluene (TNT), dichlorodiphenyltrichloroethane (DDT), or the weed killer and suburbanite's friend, 2-4-dichlorophenoxyacetic acid (2,4,D). The technicians who had to deal with these elephantine expressions daily soon resorted to terser symbols. They are showing no disposition to dally with

amplitude and frequency modulation, either. Instead, the public buys AM-FM sets. Since several types of pulse modulated communication systems are already under development, we may have to face the prospect of buying AM-FM-PM sets.

The first year in which the letters FM appear in the *Industrial Arts Index* is 1940, although the paper by E. H. Armstrong that started FM's important practical applications, "A Method of Reducing Disturbances in Radio Signalling by a System of Frequency Modulation," was published in May, 1936. Armstrong, however, did not coin the abbreviated term. In a paper published in 1930 Balth van der Pol⁸ of Eindhoven, Holland, was able to say that "A certain amount of discussion has taken place during the last years . . . [about] frequency modulation."

As for the greatest science story of our time — the story that starts with the discovery of the electron and ends its first chapter with the atomic bomb — it has had, as scientific developments go, an almost unique effect on the public's vocabulary. Darwin's theories and the announcements of Copernicus might have stirred men more deeply than the demonstration of nuclear fission, but those concepts could still be tied, here and there, to everyday experience and described in everyday words. Nuclear physics, however, is the most esoteric of sciences, made up of things that are neither matter nor energy, behaving in a manner that sometimes appears to be not merely mad but also impossible. Except for a few determined intellectuals, the public did not follow the discoveries in this field too closely, or take them very seriously. There were exceptions, of course. Those who took high school or college science courses had to learn at least something of atoms and electrons but such elementary introductions were far removed from the earth-shaking prophecies of relativity and quantum mechanics. Radium and radioactivity, primarily because of their association with cancer (rather than their implications regarding the structure of matter) gained some public interest. Even a popularizer like Wells could not make people take the same intense interest in Rutherford's theories that it did in Freud's. In *The World Set Free*,⁹ published in 1914, Wells set up an extraordinarily acute picture of atomic war (one that may become more accurate as time goes on) and saw it greeted with apathy.

Generally, as new "particles" were discovered, as new theories evolved, and as new words were coined to describe both particles and theories, the public did not absorb the new vocabulary directly from those whose minds had made the original conception. Instead, they tried to swallow it all in one gulp from the Smyth report.¹⁰ Now that the flood gates are opened, the newspapers speak, without blinking, of cyclotrons, atomic piles, isotopes of both stable and unstable variety, several brands of uranium, a whole string of elements once listed only in the periodic table (and a few not even there).

A case in point occurred during the assembly of a new synchro-cyclotron for Columbia University in December, 1947. This event was treated by the newspapers with all the fanfare of a battleship launching. The New York *Daily Mirror* carried the story under a two-column head on page 36 using a minimum of technical terms. The New York *Times*, naturally, started the story on the front page and spared the reader nothing. One paragraph read: "The protons accelerated in the (Continued on page 462)

What Is Democracy?

Individual Freedom to Improve Human Welfare, Based on the Diversity of Chance, Is the Essence of Democracy

BY H. B. PHILLIPS

AMONG the leading nations of the world, during the last half century, those with democratic form of government have had comparable populations and vastly greater resources than those with autocratic form. Yet at no time during that period has democracy seemed less safe than now. This strongly suggests that in recent times the democracies have not made effective use of their resources in promoting their own interests. If, in the future, these resources are to be more effectively used, we must know what democracy is, and, in particular, what makes a democracy strong.

Democracy is usually defined as government by the people; government in which supreme power is retained by the people, and exercised either directly or through representatives. Examples show that governments which qualify as democracies under this definition differ widely in their success in promoting the welfare of the people. Some are highly successful, some very unsuccessful. If, then, democracy is to be a necessarily desirable form of government, the definition must be further restricted. With this in mind, many writers select particular features, which are often found in democracies, and use these as the essential characteristics. Among such features are three emphasized by Aristotle and included in practically all treatments of democracy since his time. These are: majority rule, equality, and liberty. As a basis for discussion we might then define democracy as government which includes these features.

Unfortunately, however, these features cannot coexist, each in its entirety. If there is majority rule in everything, there is no liberty. If I am forced to act contrary to my wishes, it makes no difference to me whether this force is exerted by my neighbors or by a dictator. Liberty consists in the things left to individual rule. Thus, majority rule and liberty are not compatible. Similarly, equality and liberty are not compatible; for forced equality is just as great a restraint as forced inequality. And even majority rule and equality are not necessarily compatible; for the majority, as has often happened, may find it undesirable to have equality. Thus majority rule, equality, and liberty are mutually incompatible. Yet throughout history these have been the principal characteristics of democracy. Their incompatibility is a prominent cause of confusion and often of weakness in democracies, for the proponents of particular schemes select the characteristic which best favors their views and get the support of well-meaning people on the ground that any other action is undemocratic. If a democracy is to be successful, it must therefore choose which of these characteristics is to be fundamental.

If forced to choose, probably most people would take majority rule as the central feature of democracy. An

objection to this, pointed out by Aristotle^{*1} is that practically all governments have majority support. If, for example, absolutely honest elections had been held in Germany, Japan, and the United States just before World War II, there is little doubt that Hitler and the Japanese emperor would have won by greater majorities in their countries than Roosevelt in the United States. Yet no one would claim that Germany and Japan were better examples of democracy than the United States. To this, some reply that the remedy is education — that the people in Germany and Japan should have had better instruction. This is a curious suggestion by those who define democracy as majority rule since it would let a small group of teachers determine what the majority shall think. That is precisely the system of propaganda which worked so perfectly in Germany and in Japan.

The logical basis for majority rule is the notion that the larger the number of people who have a given belief, the greater is the probability for that belief to be correct. This is the argument of James Bryce² and, in a guarded way, of Herbert Spencer.³ Applied to matters of a political nature, this argument has serious defects.

It assumes, first of all, that people form their own opinions, whereas we know political opinions are mostly acquired. The average opinion is thus merely the weighted mean of the ideas expounded by sources from which opinions emanate, and the influence of those sources is determined by features unrelated to the particular issue. That the spread of an opinion is not dependent on its truth or falsity is illustrated by the singing commercials on radio programs. Large sums are spent on those commercials because they are found to be effective in forming public opinion.

This state of affairs is not much improved by education; for, as James Bryce says: "Attainments in learning and science do little to make men wise in politics. Some eminent scientific men have been in this respect no wiser than their undergraduate pupils."⁴ This failure of education comes about, I think, because the principal effects of education are to increase knowledge of the past and to improve ability to reason, whereas each political problem has so many new features that past experience is of little value and has so many unknowns that the validity of a political conclusion is rarely determinable by reason.

Thus, whether the voters are educated or not, we have little reason to expect that majority rule will be better than average rule, and average results — which we may truly construe as mediocre — are not good enough for a strong democracy. Still, many people choose majority rule because they consider minority rule the only alternative. In this, however, they overlook the third possibility,

* See references at end of article.

namely, individual rule, under which there is no single action, but each person is permitted to utilize his abilities for general progress as he sees best.

Others choose equality as the essential feature of democracy. Thus, in a statement advocating Universal Military Training, General Eisenhower said: "The fundamental principle of democracy is equality — equality of burden as well as equality of opportunity."⁵

An objection to equality as a fundamental principle is that equality is not an absolute characteristic. What is important to me is not whether I am equal to another — for no two persons are ever entirely "equal" — but to how much I am equal. Perfect equality can be provided by prohibiting the labor-saving machinery, to which workmen frequently object, and letting the men work longer hours, but this does not result in a high standard of living. In many communities there is agitation to reduce the amount of time given to difficult subjects, such as mathematics and physics, in the public schools and to concentrate more on the "cultural" subjects which can be assimilated with less effort. Such a program provides greater equality in education because larger numbers are exposed to certain minimum standards, but may result in a nation which is easier to conquer in case of war.

These are instances of equality before the law and we are told that equality in a democracy always means equality before the law. But, in practice, this legal restriction is often forgotten. For instance, T. V. Smith says: "equality must mean a more equal sharing in income, if not in wealth, than is now possible";⁶ Carl L. Becker speaks of "that equality of opportunity and of possessions without which democracy is an empty form";⁷ and James Bryce says: "Even if the law does not — perhaps it cannot — prevent the accumulation of fortunes, these will be few and not inordinate."⁸ Thus most writers who discuss equality have in mind some form of economic equality, and the income tax statutes are deliberately made discriminatory in an effort to produce this type of equality.

Against economic equality there is a fundamental objection. While progress continues, wealth and income will be subject to chance, and in a field subject to chance, values are distributed according to some form of statistical law. Thus under widely varying conditions incomes are distributed at least approximately according to Pareto's law.⁹ The precise form of these laws depends on the things distributed, but they all agree in the fact that equality is obtained only when the values are all zero. We may, therefore, expect equality of income only in a community where incomes are all substantially zero.

An interesting illustration of the mode of life which may be anticipated under conditions of complete equality of possessions was given by Charles Darwin. Before he became famous, Darwin spent some years on the English ship *Beagle* making observations of life in various parts of the world. In Tierra del Fuego he observed savages in a lower state of improvement than he thought existed in any other part of the world. Members of these tribes did not impress him as of the lowest mental capacity, yet they had no leaders and no form of government. In a country where there was frequent ice and snow these savages had only decorative scraps of clothing and almost no shelter. Being curious as to why their condition should be so poor, Darwin observed them closely. He noted that they practiced an extreme form of communism, that if one family

had food it was shared equally with the others, that if a piece of cloth was thrown to them it was torn into bits and distributed. Darwin reasoned that before the condition of these savages could be much improved, leaders would have to receive preferred treatment, that in the absence of such preference "The perfect equality among individuals comprising the Fuegian tribes must for a long time retard their civilization."¹⁰ In these tribes Darwin was observing an instance of economic equality, a condition which can obtain only at zero.

It does not seem, therefore, that a democracy based either on majority rule, or on equality, has much chance of success. Whether government based on individual liberty has a better chance depends on whether, in political affairs, it is possible to make definite plans which have a high probability of success. If it is possible, it would appear that we should find the ablest planners and give them supreme authority. There will then be no need for majority rule and the plans should provide the amount of equality and liberty that is best. Objection might be made that under this arrangement people would not be happy, and consequently some less perfect system must be adopted under which people will be more content. The answer is that if definite planning can produce the greatest success, some totalitarian nation will succeed so well that the democracies will have to adopt the same methods or become unimportant.

Some of the greatest men have evidently thought the planned state could succeed. This is illustrated by Plato's *Republic* and the various ideal states created by social dreamers since his time. A very brief study will indicate, I think, why the authors of these schemes had so much confidence in planning. These authors thought the future world would differ very little from that in which they lived. Consider, for example, More's *Utopia* which has contributed our modern name for such dream states. Sir Thomas More was one of the ablest men of his time, and of such high character that he submitted to beheading rather than to compromise on a matter of moral principle. Yet in his *Utopia* "The husbandes chastice their wyfes."¹¹ Apparently chastising wives was so common that it did not occur to More that men would ever give up this domestic pastime.

In a world so completely fixed, planning is certainly possible. But the actual world is perpetually changing in directions which are entirely unknown in advance. In such a world there is no rational basis for planning. This is because all plans are concerned with the future. Whether a particular measure is good or bad is determined by its influence on future welfare. That future will, however, be profoundly influenced by the existence of single individuals, single discoveries, or even single ideas, all of which are not only unpredictable but not even logically determined in advance. The role of the political forecaster is like that of the astronomer trying to determine the orbit of a planet the motion of which could be materially influenced by the behavior of a single one of its atoms. In Calvin Coolidge's administration who could have predicted that within 10 years the United States Government would be paying men not to work? During the Roosevelt administration who would have limited production if he had thought that within a few years lives would be needlessly sacrificed through lack of those very supplies for which people were being paid not to produce? (Continued on page 456)

Artificial Cosmic Radiation

What Keeps Atomic Nuclei from Exploding? Postwar "Atom Smashers" Now Going into Operation Have Sufficient Energy to Find the Answer to This Query

BY IVAN A. GETTING

THERE are two main aspects to the investigation of cosmic radiation. The first is the study of the cosmos through the observation of the radiation. The second is the use of the radiation in the investigation of the structure of matter itself. Of course, both of these aspects are of primary concern to scientists in extending the forefront of man's knowledge. Strangely enough, in regard to size, these two fields of research are at the extremes of man's experience.

Cosmic radiation originates somewhere outside of our own Galaxy, the Milky Way. Cosmic radiation and light from extragalactic nebulae are the only ways we have for reaching beyond the Milky Way. The nearest edge of our Galaxy is some 25,000 light-years away. Since a light-year is about six million million miles, the distances are

indeed large and the name, cosmic radiation, appropriate.

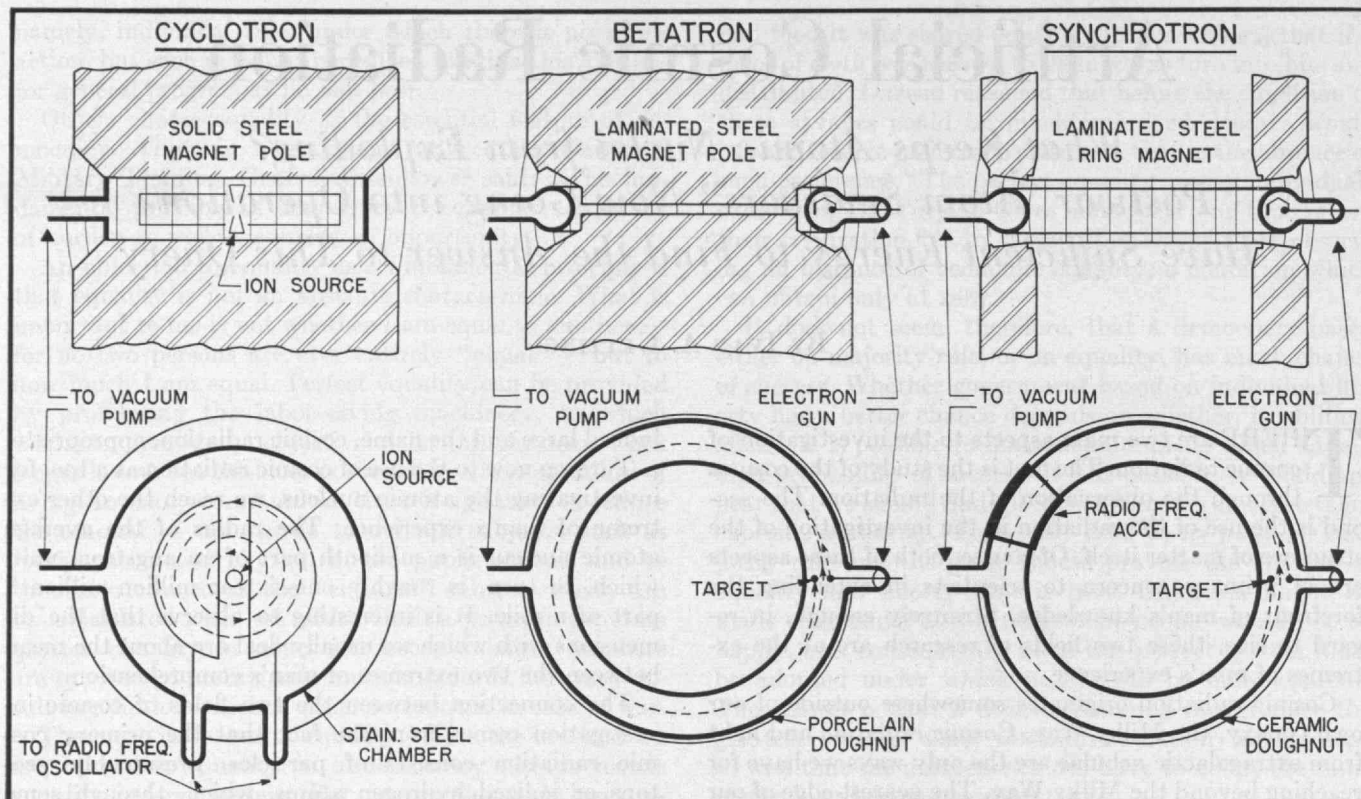
Turning now to the use of cosmic radiation as a tool for investigating the atomic nucleus, we reach the other extreme of man's experience. The radius of the average atomic nucleus is a millionth part of an angstrom unit, which, in turn, is roughly one-sixteen million millionth part of a mile. It is interesting to observe that the dimensions with which we usually deal are about the mean between the two extremes of man's comprehension.

The connection between the two fields of cosmic investigation comes from the fact that the primary cosmic radiation consists of particles, presumably protons or ionized hydrogen atoms, which, through some method as yet unknown, attain energies of from a few billion electron volts to even a billion billion electron

The Physicists' "Elementary Particles"

Particle	Mass	Electric Charge	When Created or Lost	Uses
Photon	None	None	Created when an electric charge radiates energy; lost when its energy is absorbed by a charge	Makes up light and other electromagnetic radiation. The carrier of electrical energy
Electron	0.9017×10^{-27} g. About an octillionth of a gram	-1.602×10^{-19} coulomb. About two tenquintillionths of a coulomb, negative sign	Sometimes created in, and ejected from, a nucleus. Can be created, along with positron, near a nucleus. Emitted by hot metals. A constituent of cosmic radiation	Makes up outer structure of all atoms. Responsible for their chemical behavior. Responsible for electrical conduction in metals and electron tubes
Positron	0.9017×10^{-27} g. Same as electron	$+1.602 \times 10^{-19}$ coulomb. Same magnitude as electron, positive sign	Sometimes created in nucleus. Can disappear by combining with electron, leaving two photons	A secondary constituent of cosmic rays. Too transitory to be of much other use
Proton	1.6734×10^{-24} g. About 1850 times the electron mass	$+1.602 \times 10^{-19}$ coulomb. Same as positron	Can be changed into a neutron inside a nucleus, producing a positron or destroying an electron in the process	The nucleus of an ordinary hydrogen atom. A constituent of all nuclei. Responsible for the nuclear charge and part of the mass. Also present in cosmic rays
Neutron	1.6747×10^{-24} g. Slightly heavier than proton	None	Can be changed into a proton inside a nucleus, producing an electron or destroying a positron in the process	A constituent of all nuclei. Responsible, together with the proton, for the nuclear mass. Most nuclei contain nearly equal numbers of neutrons and protons
Neutrino (existence possible)	Much less than electronic mass, possibly zero	None	Perhaps created along with electron or positron when proton changes to neutron or vice versa	Introduced to explain the energy balance when electrons or positrons are emitted from radioactive elements
Meson	0.2×10^{-24} g. About 200 times the mass of the electron	$\pm 1.602 \times 10^{-19}$ coulomb. Two particles with opposite charge, similar to electron-positron pair. Perhaps also a neutral particle	Possibly created during nuclear radiation of energy. Probably produced <i>via</i> a heavier meson called the π meson which is 1.8 times as heavy.	Possibly an analogue of the photon, carrying the energy of nuclear forces. Present in cosmic rays

Note: The disappearance of mass requires the production of about a half a million electron volts of energy for each electron-mass unit which disappears. An equal amount of energy must disappear when an equal mass is created. Electric charge can be transferred from particle to particle during a change, equal amounts of positive and negative charge can be created simultaneously, but total *net* charge cannot be altered.



Schematic diagrams of the three principal types of cyclic accelerators for elementary particles. In these machines the particles to be accelerated are made to travel in orbits during each of which energy is imparted to them.

volts.* The concentration of energy in some individual protons is far greater than can be attributed to the total disintegration of even the heaviest atom — uranium. Therefore, it is commonly held that some sort of cyclic acceleration by electric fields (or perhaps an induction field arising from a time-varying magnetic field) over tremendous intergalactic spaces may explain the tremendous energy which is observed in cosmic rays. It is only through the use of cosmic rays, or recently developed particle accelerators, that we are able to have at our command sufficient energy concentrated in a single particle to make a successful attack on the atom, and to learn the structure of its nucleus.

The atomic nucleus is a veritable fort. It is surrounded by its cloud of electrons which protect the nucleus against all small-scale assaults. These electrons are normally responsible for the emission of light and x-rays by atoms. Not until an external particle has energy of the order of a few hundred thousand electron volts is it capable of making the slightest impression on the make-up of even the frailest of nuclei. All nuclei are susceptible to modification, however, when the bombarding particle has energy of from a few hundred thousand to approximately 20 million electron volts. In general, the process of nuclear disintegration can be visualized as taking place in two steps. When the nucleus is bombarded by an external particle of sufficient energy to penetrate the electron cloud barrier, a compound nucleus is formed. Such a compound nucleus may be inherently unstable, or it may be normally stable except for the large amount of kinetic energy brought in by the impinging particle. In either case, it breaks up, usually, but not necessarily, with the emission

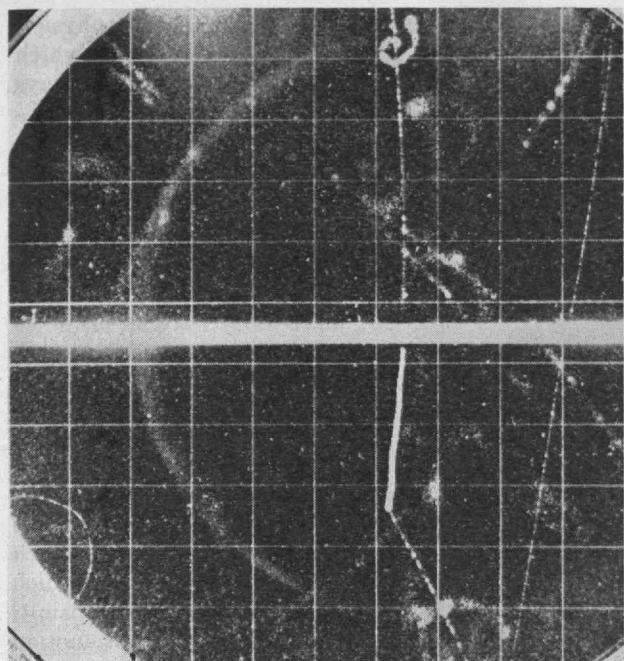
of a single particle. The remaining nucleus may or may not be stable. If it is not stable, it will achieve stability by emitting a positron or electron at some later time. Such a nucleus is called artificially radioactive.

But it is at much higher energies — until recently found only in cosmic radiation — that the experimenter has found greatest possibilities. With exceedingly high energies, he can begin to work with particles never previously observed, can witness the creation of matter or can produce explosions of atomic nuclei. In this realm of physics, better than anywhere else, the theoretical physicist can test the validity of extrapolating macroscopic concepts to physical dimensions and time intervals where no real, logical argument for such extensions can be applied; only experimental results can lead the way. The more energetic the particles, the closer they can come to the constituent elements of the nucleus. As the distances diminish, the greater becomes the expected departure from electromagnetic laws derived from macroscopic experiments. In fact, new forces must be found to explain the stability of nuclei themselves; and strange indeed are the interpretations which result.

Perhaps the greatest single discovery in cosmic-ray investigations was the independent discovery of the meson by J. C. Street and E. C. Stevenson at Harvard University, and by Carl D. Anderson and Seth H. Neddermeyer at the California Institute of Technology. Intermediate in mass between the smallest of all known particles (the electron), and the lightest of the atomic nuclei (the proton), the meson does not exist in a free state at rest. It is created as a by-product of collisions by the cosmic radiation in the earth's upper atmosphere. On the average, the meson lives but a few microseconds and then breaks up.

The meson was very anomalous at first, until evidence connected it with a particle proposed by a Japanese

* An electron volt is the amount of energy change experienced by an electron as it passes through an electric field of one volt. (1 electron volt = 1.6×10^{-12} erg.)



The path of an elementary particle can be seen under suitable conditions by little water droplets that condense on the wrecked atoms it leaves in its path. In this photograph of a cloud chamber, taken by Robert W. Thompson, 2-46, a research associate in the Department of Physics at M.I.T., the path of a meson is seen. The meson entered the chamber at the top center of the picture. The path, which is slightly curved by the magnetic field traversing the chamber, is used to measure the momentum of the particle. Horizontally across the middle of the chamber is a lead plate which the meson penetrated with barely enough energy to proceed a few more inches before coming to a final stop. Its decreased speed is indicated by the thickening of the path track. At the end of its track, the meson "decayed," that is, disintegrated, giving off an electron at high energy. Since the meson was approximately 200 times as heavy as the electron, this photograph is a record of the conversion of matter into energy. The path of the electron — which is much less prominently marked than that of the meson — is seen leaving the cloud chamber at the lower right-hand part of the illustration, approximately where the figure five would be positioned on the face of a clock dial.

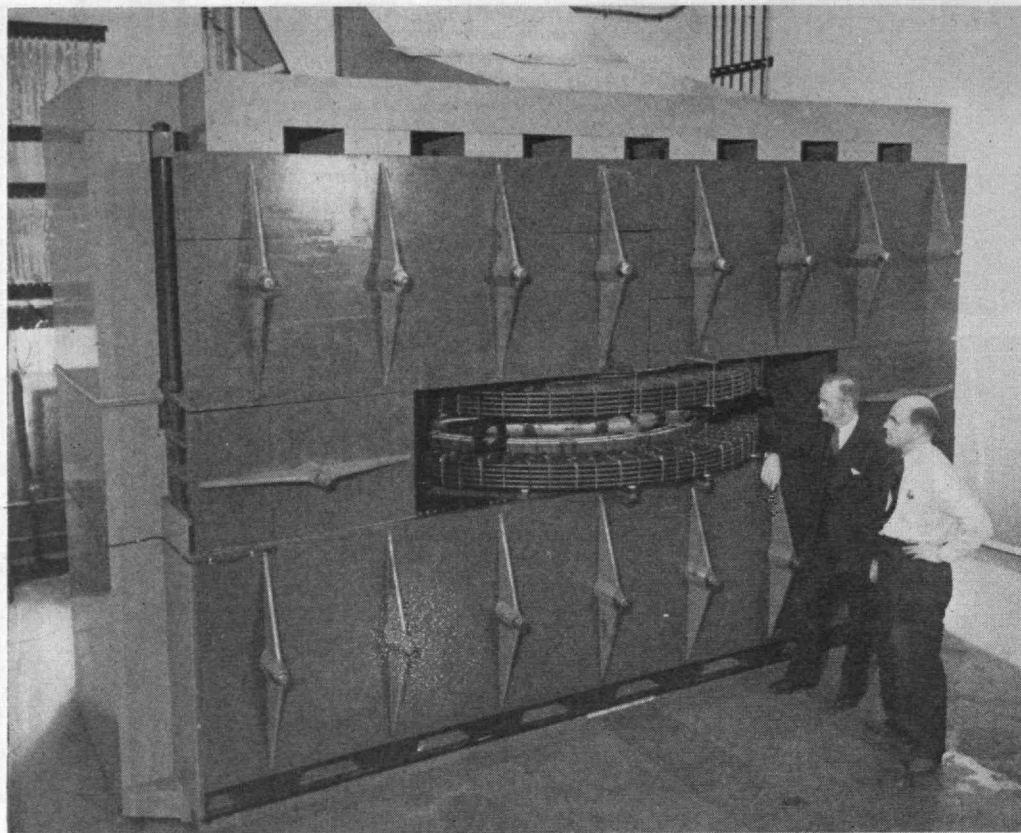
theoretical physicist, Hideki Yukawa, in 1935. Yukawa proposed that the meson would explain the attractive forces within the nucleus itself. The meson, according to this concept, is a realization of a mass field (called a meson field), which is analogous to the photon as a particle realization of electromagnetic energy in an electromagnetic field. It is the mass field of the meson which is thought to keep the nucleus of the atom together. If, however, an external particle collides with the nucleus with sufficient energy equivalent to the mass of a meson * then such a meson particle can be freed from the nucleus. Sufficient data are not yet available to permit establishment of a unique theory; this is on the frontier of man's understanding of nature.

From this discussion it should be evident that means for producing elementary particles of high energy are of tremendous importance in modern science. Elementary particles having energies of from a few hundred thousand electron volts to 20 million electron volts or more are required to investigate the simpler processes of the atomic nucleus. Energies considerably in excess of 20 million electron volts hold forth the most promising fields for new explorations. The required energies can be imparted to electrically charged particles by sufficiently powerful electric or magnetic fields to produce the required accelerations.

Laboratory accelerators, which are able to produce energy in the required ranges, have been developed during the past 20 years. One of the most notable of the machines designed to impart high energy to elementary particles is the cyclotron which was invented by Ernest O. Lawrence of the University of California and his associates, notably M. Stanley Livingston, Associate Professor of Physics at M.I.T. The electrostatic generator, invented by Robert J. Van de Graaff, Associate Professor of Physics at M.I.T., is another mechanism for attaining the high energies required for atomic nuclei studies. Still another is the betatron invented in 1939 by Donald W. Kerst of the University of Illinois. The newest of such particle accelerators is the synchrotron, originally proposed independently in 1945 by Edwin M. McMillan of the University of California and V. Veksler in Russia. Each of these different types of accelerators has its unique characteristics and advantages, and consequently all of them have a place in present studies of the ultimate structure of matter.

* According to the Einstein relation, $E = mc^2$, where E is the energy in ergs, m , the mass in grams, and c , the velocity of light which is 3×10^{10} centimeters per second.

Mesons, protons, and alpha particles leave visible tracks in photographic plate emulsions. In this photograph, taken by C. P. Powell and G. P. S. Occhialini at Bristol University, England, a meson track is seen entering the emulsion at the lower left corner. It proceeds to the right, being continuously slowed down by collisions with the atoms in the emulsions, as is evidenced by the thickening of the path. This meson, known as a π meson comes to rest and disintegrates into another meson, called a μ meson, plus other radiation. The μ meson proceeds up and to the right coming to rest again within the emulsion at the upper right-hand corner. By measuring the length of path, the density of grain darkening, and the scattering in the direction along the path it is possible to deduce that the mass of the π meson is 1.8 times that of the μ meson.



The General Electric betatron accelerates electrons to 100 million electron volts. It is the largest machine of this type in existence. The magnet weighs approximately 130 tons.

To understand the basic operation of the different types of particle accelerators, it is well to recall how elementary charged particles behave under the influence of electric and magnetic fields. In the presence of a constant and uniform electric field, a slowly moving, low-energy particle is uniformly accelerated and its speed and energy consequently increased. With increased energy, however, the apparent mass of the particle increases; this is sometimes referred to as the relativistic mass increase. Further acceleration will increase the speed of such particles up to, but never quite reaching, the velocity of light. Near the speed of light, an electric field can no longer appreciably increase the speed of a charged particle, but the momentum of the particle increases without limit as the apparent mass increases without limit. On the other hand, a constant and uniform magnetic field produces no force on the charged particle unless the particle is moving. For a particle moving in a uniform magnetic field, the resulting force will be at right angles to both the velocity and the magnetic field. For example, a charged particle moving at constant speed perpendicular to a uniform magnetic field will move in a circle corresponding to an acceleration just opposite to centrifugal force. The radius of the circle is proportional to the momentum of the particle. At low speeds, the momentum of the particle is equal to the mass of the particle multiplied by its velocity. At such low speeds, therefore, the time for one orbit is independent of the speed of the particle. In the relativistic range, the momentum is no longer proportional to the velocity of the particle and hence the time per revolution is no longer independent of the velocity of the particle, or its equivalent, the energy of the particle. Different combinations of electric and magnetic fields are employed in the various particle accelerators

used in nuclear physics. A magnetic field which varies with time is always accompanied by an induced electric field which can also be used for the acceleration of the charged particles.

The cyclotron uses a large magnet to keep charged particles moving about in concentric circles. It is a characteristic of the cyclotron that the time required for the particle to complete a circular orbit is independent of the energy of the particle. A radio frequency oscillator (which is fundamentally much like a broadcast transmitter) is used in conjunction with the magnet to provide an electric field which gives a sudden acceleration or "kick" to the particle each time it completes a semicircular path. In so doing, it increases the energy (and therefore the speed) of the particle

twice in a complete round trip. Because the particles have the same frequency of rotation as that of the oscillator — that is, they are in resonance with the oscillator — the cyclotron is sometimes referred to as a resonance machine. The particle traverses a spiral path of increasing radius, and makes a round trip during one cycle of operation of the oscillator. A limit to the maximum energy of the particle is set by the increase in the relativistic mass of the particle. As the mass of the particle increases, it is no longer able to derive the same acceleration from each "kick." This spoils the resonance condition. The practical limit for cyclotrons is in the neighborhood of 20 million electron volts for positive particles like protons, deuterons, and alpha particles. The energy limit for electrons is well below half a million electron volts, so that the cyclotron is not used to accelerate electrons.

Other equipment to impart high energy to elementary particles uses straight acceleration by direct voltages in the range up to five million volts. It is quite costly to obtain such high voltages by rectifying the output of high-voltage transformers, and therefore other means for obtaining the necessary potentials have been developed. The most notable contribution in this field was the development of the electrostatic generator, known by the name of its inventor — Robert J. Van de Graaff of M.I.T. These static generators can be used for any charged particles. The output of the equipment is characterized by exceedingly good homogeneity of the beam. So far, practical limits and costs have limited the output of these machines to less than five million volts, although a twelve-million volt machine is now under construction at M.I.T. by John G. Trump, '33.

To provide for a controlled source of particles of sufficient energy to make mesons in the laboratory is now

"big game" in electrical engineering and physics. A partial approach was made by the invention of the betatron by Kerst in 1939. The betatron has been used only with electrons, and the largest machine built so far has produced particles of 100 million electron-volts energy. If we accept the present tentative mass of the meson within the nucleus as 360 electron masses, the minimum energy required to produce a free meson is 180 million electron volts, according to the Einstein relation. Hence, the largest betatron now in existence misses the chance to produce mesons by 80 million electron volts. A 300-million electron-volt betatron is now under construction at the University of Illinois, and it is believed that upon completion this machine should be capable of producing mesons easily.

The performance of the betatron is based on electromagnetic induction and the accelerator is identical in principle to the operation of an ordinary alternating-current transformer. Both the betatron and the alternating-current transformer make use of Faraday's law — a time-varying magnetic field is always accompanied by an induced voltage.

The transformer core (usually called the magnet in a betatron) is made of laminated steel and is excited by alternating current flowing through the primary winding. In the ordinary transformer, the output current flows in a secondary winding which channels the direction of the flow of the electrons. In the betatron, however, the output or secondary current is a beam of electrons flowing in a vacuum. The electron beam is forced to flow into a circular orbit by the strong magnetic field of the magnet. The magnet or transformer core of the betatron serves a dual purpose: it provides the electromotive force and also a focusing force to keep the electrons in a stable circular orbit. It is the twofold purpose of the magnet which establishes a limit to the maximum energy of the particles in the betatron. Because the electrons move at high speed, and are simultaneously accelerated inward to go in circles, they radiate energy in the form of visual light. This radiation, at the higher energies, upsets the balance between the two requirements and limits the practical energy of the betatron to a few hundred million electron volts.

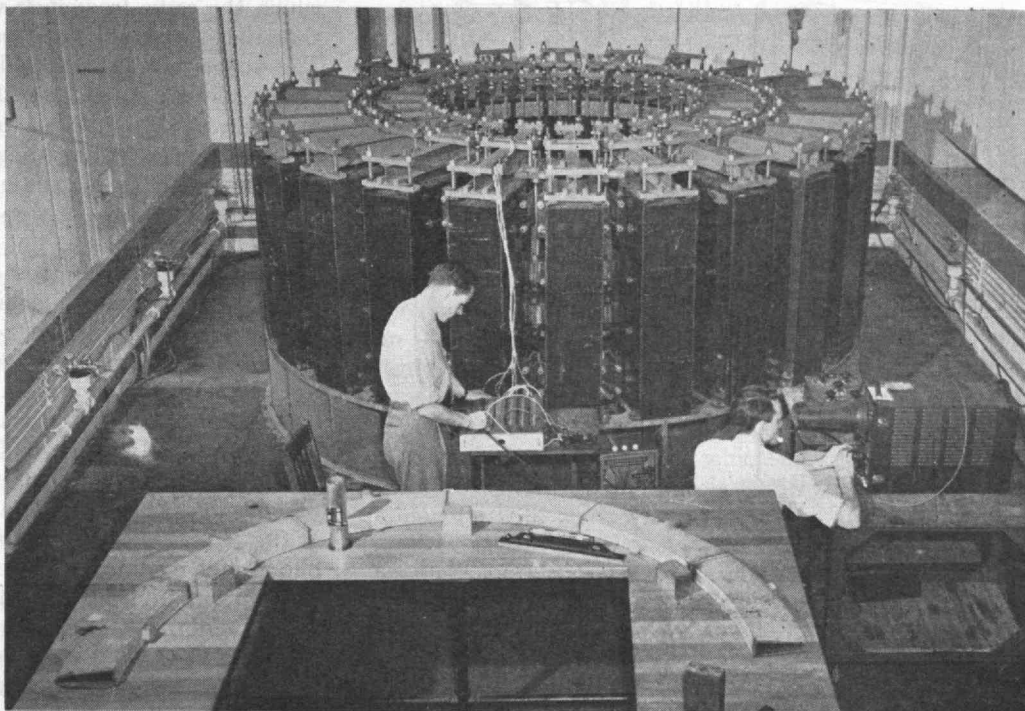
The sequence of operations in a betatron are as follows: (1) by means of a standard electron gun, the electrons are injected into a highly evacuated tube of doughnut shape at about 50,000 volts, immediately after the magnetic field passes through its zero value; (2) the electrons are accelerated by induced electromotive force to the peak value of the machine when the field of the mag-

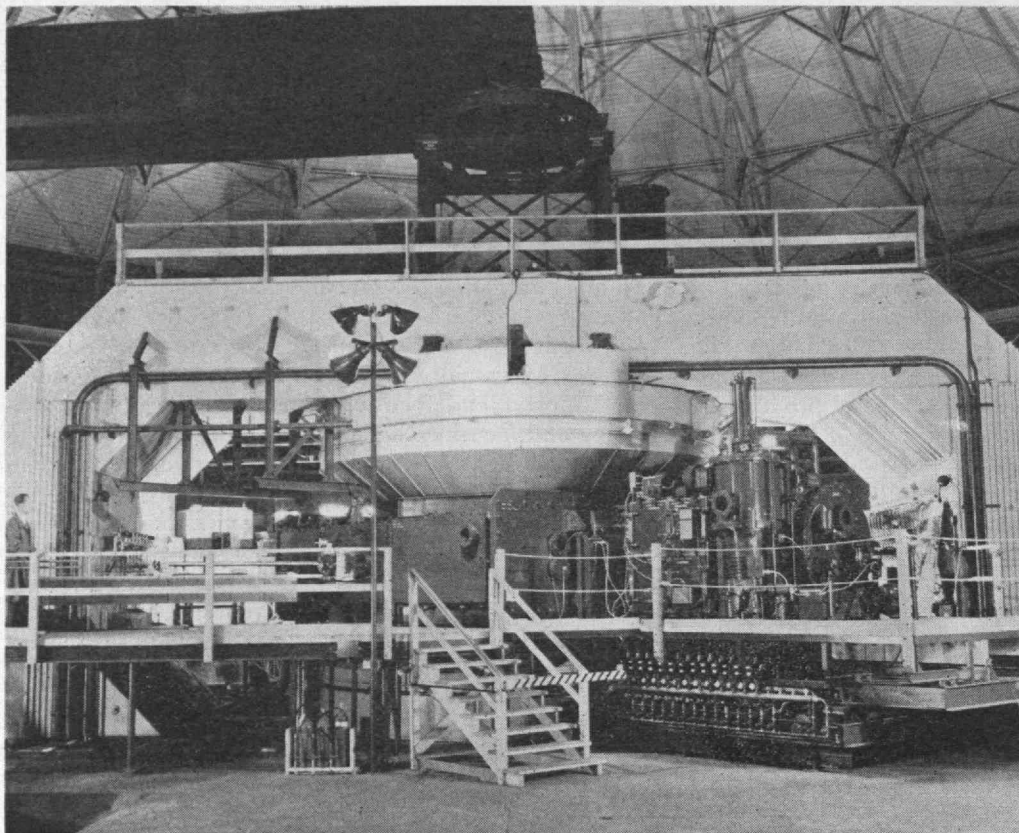
net may be, for example, 7,000 gauss, and the energy of the electrons has reached 100 million electron volts; (3) the electrons are forced to spiral inward against a tungsten target by a momentary additional magnetic field. When the electrons strike the tungsten target, their energy is converted into high-energy x-rays which penetrate the walls of the tube.

The most plausible method of achieving artificial energies approaching the primary cosmic rays is embodied in a machine called the synchrotron. Physically, the synchrotron resembles a cross between a cyclotron and a betatron, for it uses radio-frequency power to accelerate the particles, and an alternating current magnet to provide a circular orbit and focusing. Since the forces for accelerating and focusing the beam are independent, the synchrotron has fewer design and operating limitations than the betatron. In its simplest form, as used for accelerating electrons, the synchrotron employs a constant frequency radio-frequency oscillator and accelerates the electrons only after they have nearly reached the velocity of light. In the M.I.T. synchrotron, for example, the electrons are accelerated from an energy of approximately two million electron volts to 300 million electron volts. In this range the electron velocity varies from 98 per cent of the velocity of light to essentially the velocity of light. The electron is brought up to the two-million volt range by betatron action, so that one can think of the betatron here as a two-million electron-volt injection gun for the synchrotron.

The sequence of operation of such a synchrotron is as follows: (1) the electrons are injected at 50,000 volts into a very low magnetic field (8 gauss) exactly as in a betatron; (2) the electrons are accelerated to two million electron volts by electromagnetic induction, the magnetic field increasing with time up to 200 gauss; (3) the radio-frequency voltage is applied across a gap in the orbital

The M.I.T. synchrotron is one of the four largest machines under construction for accelerating electrons. It is designed to accelerate electrons to 300 million electron volts. The synchrotron is a much more efficient machine in the use of iron than a betatron. The synchrotron magnet weighs only 55 tons, while a betatron magnet for the same energy would weigh nearly 1,000 tons.

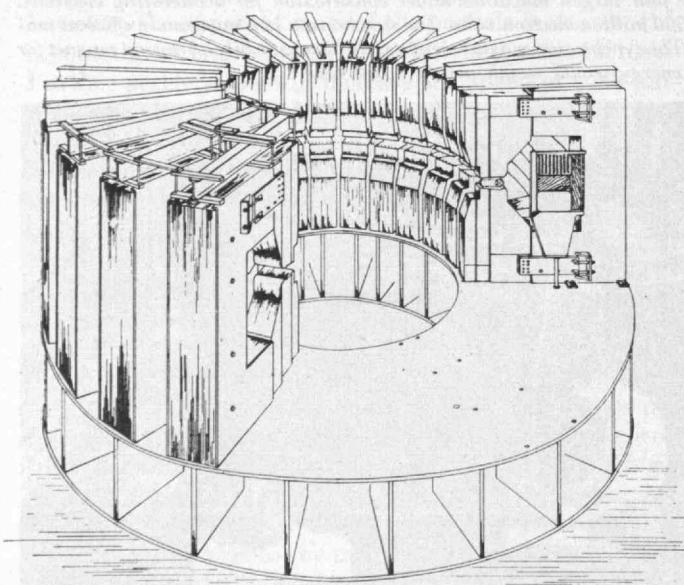




A general view of the giant Berkeley cyclotron, now producing 200-million-electron-volt deuterons and 400 million-electron-volt alpha particles operating as a synchro-cyclotron, taken before the installation of the concrete shielding. In the right foreground, on the truck which moves on rails in the floor, are mounted the round vacuum housing for the rotating condenser, its associated vacuum pump, and behind them the oscillator housing. At the left can be seen the target probe, a shaft entering a port in the main vacuum chamber.

path of the electron (see page 436), and is kept on until the magnetic field has reached its peak value of 10,000 gauss $1/250$ second after the beginning of the cycle; (4) the electrons are forced to strike a tungsten target by a momentary disturbance in the magnetic field or by turning off the oscillator. Phase (3) is the synchrotron phase.

In principle, the synchrotron resembles a synchronous

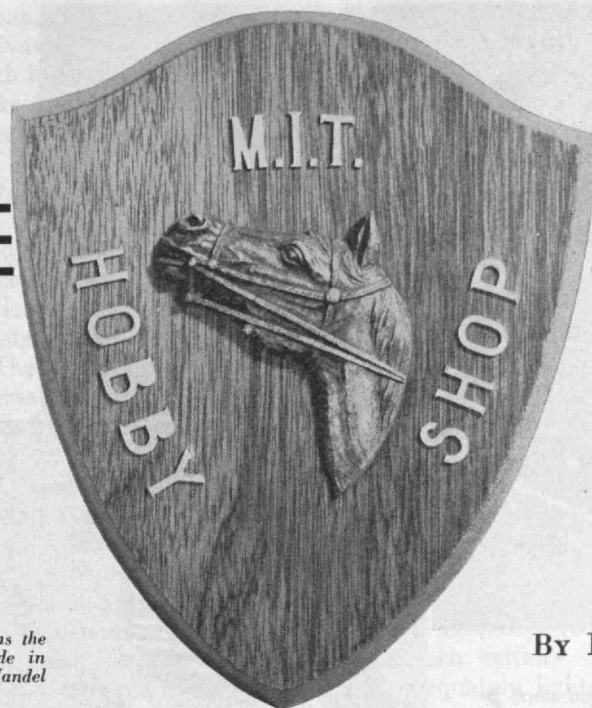


The magnet of the M.I.T. synchrotron consists of 24 C-shaped magnets, each magnet weighing over two tons. Each section is 13 inches thick and is made of .014-inch transformer steel. The poles of the magnet face inward. The acceleration tube is placed between the poles of the magnet. The energizing coil is shown on the right through the hole in the C section. The magnet requires 6,000 amperes peak current and a peak voltage of 15,000 volts.

motor with the electrons (or protons in a proton synchrotron) acting as the rotor. If the magnetic field of the synchrotron magnet were kept at a constant value, the electrons would keep rotating at an energy value corresponding to the field; the electrons would cross the accelerating voltage gap at the time when the accelerating voltage was zero — or at zero phase, in other words. As the magnetic field increases, the radius of the orbit decreases, and so does the time for a particle to make a round trip. Since the particle then arrives at the gap earlier than that outlined above, it passes the gap (across which the radio-frequency voltage is applied) at such a time that there is an accelerating voltage across this gap. The faster the magnetic field is increased, the greater is this accelerating voltage and hence the greater is the gain in energy for each orbit of the electron. Provided that the radio-frequency voltage across the gap is large enough and the change in magnetic field not too great, the electron cannot get out of step with the accelerating radio-frequency voltage.

The largest synchrotron now in operation is the 70-million electron-volt machine at the General Electric Company's laboratory at Schenectady, N. Y., but 300-million electron-volt synchrotrons for the acceleration of electrons are being built at M.I.T., the University of California, Purdue University, Cornell University, the University of Michigan, and in England. Proton synchrotrons exceeding the billion electron-volt range are in the design stages at the Brookhaven National Laboratory and at the University of California; and a one and one-half billion-volt machine has been started in England.

The term "synchro-cyclotron" has been applied to another version of the synchrotron in which the magnet is kept at a fixed value and the radio frequency is varied to keep the machine in synchronism (*Concluded on page 452*)



The wood and metal shield, used as the heading for this article, was made in the Hobby Shop by Bartholomew Mandel

BY ISAAY STEMPNITZKY

NO man can be considered to be well rounded if his interests are completely locked up in his business or his profession. Some people take their work so seriously that they lose their perspective and sense of humor; others may use their work as a means to escape certain obligations. No matter how satisfying an individual may find his occupation, however, he always has, or should have, some additional energy left to devote to creative activities which are just as essential to his happiness as is a successful business or profession. A nice balance between creative avocational and professional activities is necessary to develop a complete and emotionally wholesome social being.

In a sense, hobbies and avocations are one of the most effective forms of insurance against boredom. During the past few decades there has developed a steadily growing awareness in civilized society of the importance of recreation in general and of hobbies in particular. Before man's ingenuity had developed technology to its present high level, his work often furnished him a means to express his individuality. Today, however, work has lost this creative significance for very many people who seek an activity which will serve their need for self expression in much the same way as pride of workmanship served the need of earlier craftsmen. Hobbies fulfill this requirement.

Hobbies serve all manner of purposes for different people, and may satisfy multiform needs in the same individual at various times. Both physically and emotionally, hobbies complement the daily occupation of an individual. They compensate for environmental monotony, satisfy the need for new experiences, and provide escape from reality. Hobbies serve as a means to discharge aggressive drives, satisfy the need which most people have of belonging to a group whose members have common interests, or, alternatively afford excellent sources of solitude for the individual.

It matters not what hobby one chooses, in most cases, but the most beneficial hobbies are probably those which provide a lifelong appeal, and can be taken up at any time. Some persons find satisfaction in binding books,

building telescopes, or grinding gems; others, in painting, photography, carpentry, etching, or carving. Still others delight in magic, gardening, or even reading, mathematics, or astronomy. Indeed, in the selection of a hobby, there is no accounting for taste. Recently, the newspapers carried a story about a Chicago butcher who took up whittling after shop hours. He devoted four years in converting a plank of wood 18 feet long and 22 inches wide into a 350-foot chain. Full of pride upon completing the self-assigned task, he wrapped the chain around himself and had photographs made for posterity.

Although the primary value of a hobby lies in the development of personality, frequently it has proved to have appreciable commercial value as well. More than one person has turned a hobby into a means of making a living when economic reverses overtook him. With a population whose average age is increasing, so that more and more persons are able to retire, the outside interests developed through hobbies make the transition to retirement pleasant and something to anticipate rather than to fear.

In the belief that hobbies form an essential part of a well-rounded education and should be part of the normal activities of every individual, the M.I.T. Hobby Shop was established to provide for "all students of the Institute the means for doing such work as they desire in order to make their spare time useful and pleasurable." It thus provides an opportunity for students to develop interesting and useful avocations, even though they may have had no experience in any hobby. In fact, one of the most important functions of the Hobby Shop is to encourage students to participate in avocations which may be new to them. Another important function is to provide students with opportunity to work with their hands, and thus to lend additional practicability to the more theoretical courses which form a major portion of the academic work at M.I.T.

The Hobby Shop is primarily and predominantly an activity for, of, and by M.I.T. students. Under certain conditions however, membership in the Hobby Shop is also open to the M.I.T. staff and Alumni who, as stu-



◀ Radio and electronics are popular hobbies with many Technology students who derive much satisfaction in building, testing, and using radio receiving and transmitting equipment, recorders, measuring equipment, or any of the many gadgets to which electronics so well adapts itself. In the radio shop, Daniel D. McSwiney, '49, checks the electrical performance of a finished rectifier-power supply while Robert D. McCadden, assistant superintendent of the Hobby Shop, completes the wiring of an audio amplifier.

▶ A job-printing press and a good stock of type of various sizes and fonts are available for students who are interested in printing as a hobby. Shown practicing this hobby are Eduardo H. Armanino, '48, master craftsman, operating the press, while Richard V. Baum, '48, foreman of the Hobby Shop, makes corrections in type which has been set. In the background is the optics and lapidary room where students may grind and polish lenses, such as those for reflecting telescopes, or may exercise their talents in the grinding and mounting of gems.



dents, were members of the Hobby Shop. Management of the Hobby Shop is entirely by students but full-time craftsmen and a Faculty advisory committee are available to students who may desire instruction or guidance in their projects or in the administration of the Shop.

The M.I.T. Hobby Shop was organized in the fall of 1937 by a group of undergraduates, in co-operation with the Technology Museum Committee under the guidance of Arthur C. Watson who was then its chairman. A room in the basement of Building 2 was set aside for the Hobby Shop, and equipment was donated by many departments of the Institute. The original workshop had a floor area of about 350 square feet and, in addition to the more necessary hand tools, contained a bench lathe, a woodworking lathe, a circular saw, a jig saw, a drill press, and a grinder. By the end of its second term, the Hobby Shop had grown sufficiently to be able to assemble a good-sized exhibit for the Open House activities in the spring of 1938.

During the early growth of the Hobby Shop, many ingenious articles were built for the hobbyists' own use; a few of them fell into the category of co-operative activities, and some projects were even subsequently displayed in the halls of the Institute as a part of permanent exhibits. These projects include a mechanized exhibit of mathematical models built by Edmund B. Hammond, Jr., '40, under the guidance of Professor Raymond D. Douglass, '31, of the Department of Mathematics, an

exact replica of the first telephone instrument of Alexander Graham Bell, and a carefully detailed model of a glass factory and one of a pottery factory, both of which are on permanent display. During these early days, the lack of funds did not deter the hobbyists; odd pieces of lumber were transformed into a row of bins for tools and a few odd pieces of worthless pipe showed up later as legs of a shop bench. When an alarm was sounded because of the scarcity of knives, five old hacksaw blades were transformed into most respectable-looking knives of assorted sizes and shapes. In order to provide pleasanter surroundings than those offered by bare walls decorated by pipes, George Y. Yevick, '42, painted a mural which he donated to the Shop.

While devoting a considerable amount of time and effort to the building of the Hobby Shop, the first members found time to make some of the most interesting and unusual projects the Shop has ever seen. One imaginative fellow made a "perpetual motion machine" which almost appeared to disprove the laws of thermodynamics.

During the early part of World War II, the Army Specialized Training Program at the Institute brought a large attendance of enlisted men to the Hobby Shop. Many of them were skilled craftsmen and their work (which included construction of everything from a pair of candlesticks to a full-sized bed) compared very favorably with high-quality commercial products. "I am one of

those people," wrote Jack J. Hinman, 3d, 9-46, Lieutenant Commander, United States Navy, "who finds it relaxing and pleasurable to work with his hands in spare time, as a rest from work on the books. If I had been here long enough to fix up a house, I know the Shop would have been a source of real savings."

The Hobby Shop's contribution to the war effort included the construction of a large number of airplane models which were subsequently used by the armed services in the instruction of airplane recognition. The major project under this category was a relief map (four feet by six feet) of the defense area of Australia, where Allied forces were battling the Japanese. The relief map, made under the guidance of Mr. Watson, was completed in two months and sent to the United States Military Academy at West Point.

In the fall of 1946, the number of civilian members at the Shop was sufficiently large to begin a new organization. Officers were elected and various committees were set up to study the needs of the various departments of the workshop. Most of the original tools and machinery, which were already used equipment when donated by several departments of the Institute, have been in constant use for nearly 10 years and will be replaced as soon as funds become available. The used equipment donated to the Hobby Shop has proved to be excellent material as projects for reconditioning. A 14-inch Reed lathe, for example, donated by the Machine Tool Laboratory, had to be adapted to the existing facilities at the Shop. Among other things, a new type of drive and speed-changing mechanism was designed and made at the Shop by one of the master craftsmen. An old drill grinder, recently donated by the Mechanical Engineering Department, solved the difficult problem of sharpening tools, after it was completely reconditioned by an enthusiastic hobbyist. Existing machines are constantly being enriched with new and useful attachments — products of the imagination and skill of some of the members. One of the members, for example, has designed, constructed, and installed an unusual type of vacuum machine to recover, filter, and feed the lubricating oil used in the milling machine.

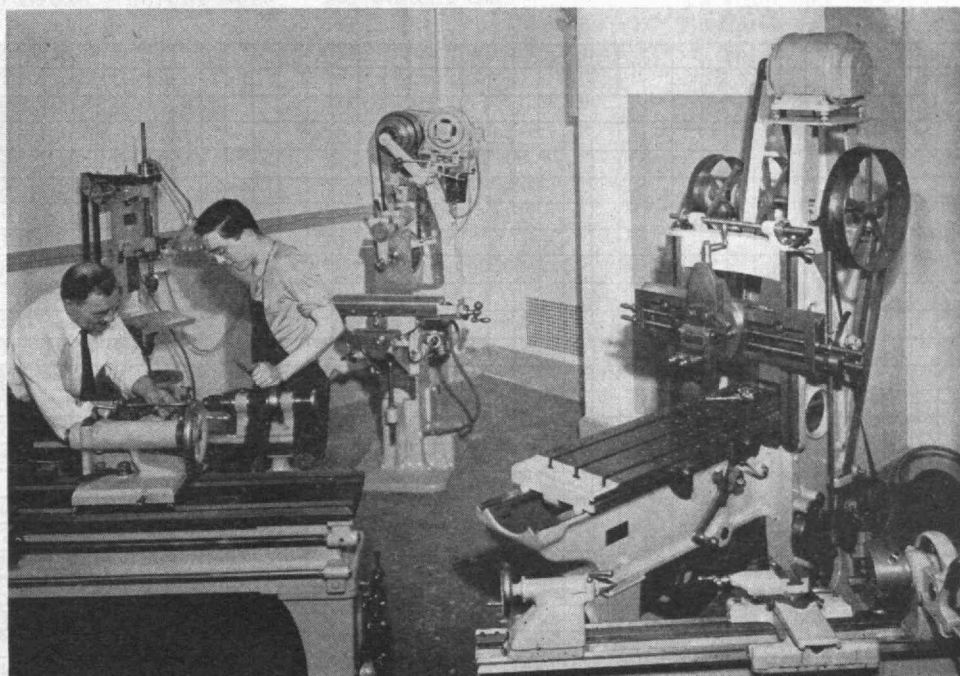
Joseph F. MacAllister, the present superintendent, has been associated with the Hobby Shop since 1942. A highly skilled craftsman himself, Mr. MacAllister has helped many of the Shop members to develop their creative abilities to points of really fine craftsmanship, and by keeping abreast of the activities in the hobby work, he has introduced many new and interesting hobbies. It is interesting to note that more than two thirds of the newcomers do not have the most rudimentary knowledge of the use and care of even the simplest and most common of tools. These students are taught the fundamentals of the use and care of tools before they are permitted to make use of any equipment. Some students who take too seriously the old saying that "all work and no play makes Jack a dull boy" are promptly given a lecture on the true meaning of the adage.

Recently the Institute has allocated additional space for the much needed expansion of the Hobby Shop. Bookbinding, gem grinding, lens making, glass blowing, foundry work, woodworking, and metalworking, all of which were formerly crammed into one room, three bays in size, have now been redistributed, allowing more floor space for each activity. Although the newly allocated room is adequately lighted, the former section of the Shop is very much in need of better lighting, and fluorescent fixtures will be obtained as soon as funds become available.

In spite of limited facilities, the Hobby Shop has seen the completion of many interesting projects. A few of these, such as an arc-welding machine built from an old General Electric pole transformer, and a dielectric-heating machine which not only glues wood but broils hamburgers as well, were made for the membership in general. Individual projects range from printing personal Christmas cards to rebuilding an old Rolls-Royce and even completely furnishing a home. One of the models presented at the recent Fisher Body Contest was made at the Hobby Shop, and it brought to Charles M. Jordan, '49, a prize of \$4,000.

Students who use the Hobby Shop are made acquainted with the various machines (*Concluded on page 460*)

The machine shop is provided with lathes, drill presses, and milling machines for almost any kind of metal work, and some of these are shown here. Under the friendly and able guidance of Joseph F. MacAllister, Hobby Shop superintendent, Richard A. Poirier, '50, learns a few pointers on precision of measurements as applied to lathe work. Although not illustrated, a photographic darkroom, wood-turning and carpentry shop are also available for student use.



Technology Crossword Puzzle

*Terms Every M. I. T. Student and Alumnus Know
Are Incorporated in a Challenging
Crossword Diagram*

By JOHN M. KECK

UNDOUBTEDLY many readers of The Review engage in the popular pastime of solving crossword puzzles. For this group an innovation is presented in a crossword puzzle bristling with terms, abbreviations, symbols, and activities which form a part of the life of every student at the Institute. Some terms are as up to date as today's newspapers; others may revive reminiscences of "the Tech on Boylston Street."

The cult of crossword puzzle addicts includes some diagramless fans who prefer to work out suitable words without the aid of the scaffolding which the crossword diagram affords. For such, the tabulations of vertical and horizontal terms, beginning on pages 445, 454 and 456 may be used without reference to the sketch below.

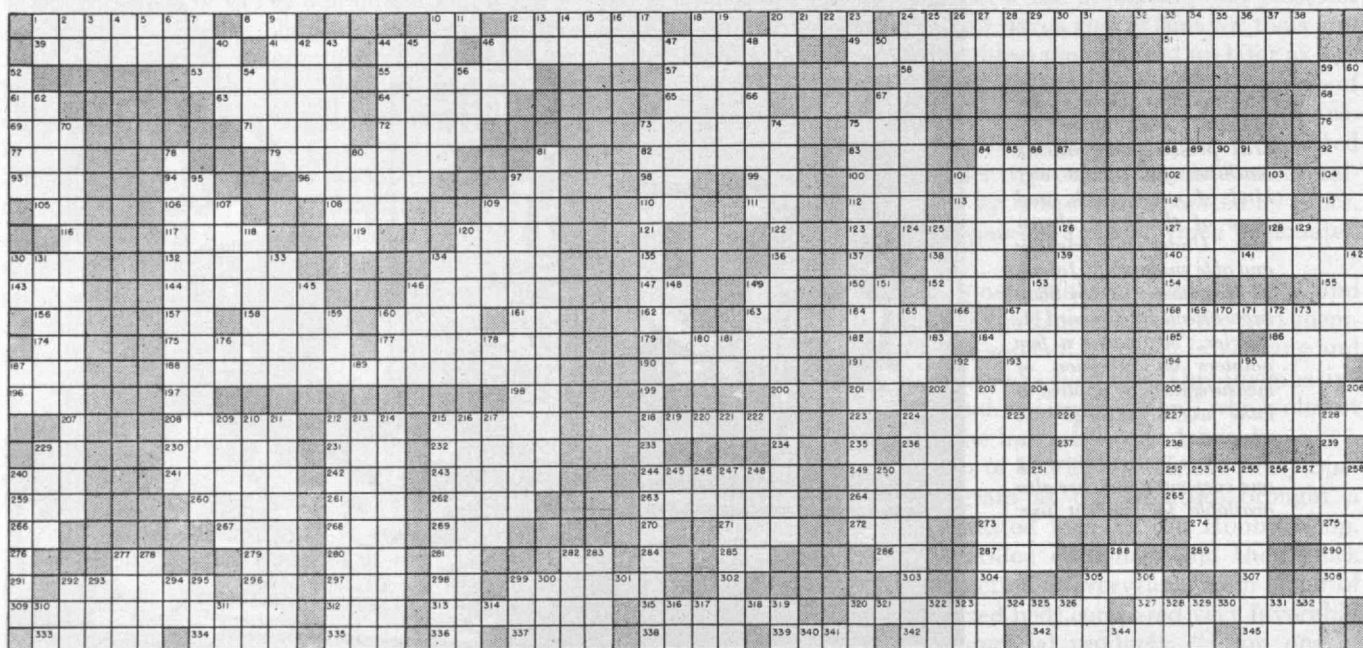
For perhaps the greater number who prefer to fill in the customary checkerboard diagram, this is presented below. The diagram is of interest to Technology students and Alumni, not only because of the considerable array of M.I.T. terms employed, but also because the diagram includes designs significant in science and engineering. In addition to the initials of a well-known school of technology, the reader will find symbols for the four arithmetic operations, the sign for equality, and the irrational constant, π , which crops up in every branch of science and engineering. Nor are the athletes overlooked; for them is the traditional *T* for Technology.

The puzzle is made up according to most of the standards for crossword puzzles, such as those used in the

puzzle pages of the weekly magazine sections of the New York Times and Herald Tribune. But two deviations from this practice will be found: (1) there are some duplicate words, but this use is justified since a separate and distinctive key or definition appears for each such term; (2) there are some single-letter words, but none are unkeyed, and these are marked with an asterisk (*). Single-letter terms are defined according to general engineering usage; for example, the letter *g* is universally employed to express the acceleration due to the force of gravitational attraction.

Filling in the diagram below should not be too difficult a task, although it will not be quite as easy as the prank one commuter played. If possible, he would select a seat adjacent to a crossword puzzle addict, pull out his paper, and turn to the daily puzzle. Then, as rapidly as he could write, he would fill in the small squares, much to the annoyance of his methodical and much slower neighbor. After a few moments of active pencil work, he would fold up his paper with a beaming air of satisfaction, leaving his neighbor to wonder at his ability in semantics and etymology. Apparently it made no difference to the fast worker that his injected letters made absolutely no sense whatsoever.

Keys to the horizontal words will be found on page 445, whereas the key to words in vertical columns appears on pages 445, 454, and 456. Solution to this puzzle will appear in the July issue of The Review.



HORIZONTAL

- 1 No Man's Land at M.I.T.
 8 Electric current type
 10 Customary M.I.T. degree
 12 West Indian superstition re charms and witchcraft
 18 U.S. legally registered symbol (abbr.)
 20 M.I.T. Avenue (abbr.)
 24 Bright rich color
 32 Our subway station
 39 Negro tribe in Cameroons
 41 Heroic U.S. President's nickname
 44 Inc. (French)
 46 The drone of our Tech song at a smoker
 49 Performed his profession
 51 Tech Show's Honorary
 52 Boron symbol*
 53 Part of eyeball coat
 55 Siouan Indians
 57 Anarchistic
 58 Length unit* (abbr.)
 59 Cobalt symbol
 61 Paid notice
 63 Floats aloft
 64 Re European thrush
 65 Egyptian alloy
 67 Rubidium
 68 Public secondary school (abbr.)
 69 Our undergraduate scientific monthly (abbr.)
 71 Prepare for publication
 72 U.S. now has 32 (abbr.)
 73 Legal term: Inquiry (Lat.)
 75 Comparative suffix (var.)
 76 American Institute (abbr.)
 77 Norwegian masculine first name
 78 One thousand*
 79 Electric current instrument
 81 Our athletic letter award*
 82 Remove bottom from a shoe
 83 New Britain Industry (abbr.)
 84 Lost important body fluid
 88 Electric power unit
 92 B. & A. (abbr.)
 93 Cathode reaction (abbr.)
 94 Army Corps (abbr.)
 96 Wooden shoe
 97 Exclamation of surprise
 98 Prefix ad- before "c"
 99 Small letters (print.)
 100 Street urchin
 101 City of Orange Bowl football
 102 Tropical palm genus
 * Single letter
 † M.I.T. special definition
- 104 Lithium symbol
 105 Sister continent (abbr.)
 106 Catch the breath in weeping
 108 Negative adverb (Lat.)
 109 Penned: Wr ---
 110 Neighboring state to M.I.T.
 111 British coin (abbr.)
 112 Energy unit
 113 Peevish
 114 Sweetheart
 115 Plural suffix often used
 116 Time symbol in formulae*
 117 Telephone in Conn.: --- Co.
 119 New* (abbr.)
 120 Conspire
 121 Ton* (abbr.)
 122 Sulphur symbol*
 123 Gravity symbol in formulae*
 124 Ethereal salt
 126 Fluorine symbol*
 127 Untanned calfskin
 128 It is (poet.)
 130 Greek letter
 132 Re ancient Athens
 134 In poetical harmony
 135 One*
 136 Our honor mark*
 137 Radius symbol in formulae*
 138 Weight: in India
 139 Direction* (abbr.)
 140 Enclose in a globular body
 143 Course I adjective (abbr.)
 144 Fair booths or stalls
 146 Picturesque
 147 M.I.T. alumni organization (abbr.)
 149 River in Italy
 150 Broad thoroughfare (abbr.)
 152 Bitter vetch
 153 Fourth-year class (abbr.)
 154 Right* (abbr.)
 155 Pronoun
 156 Football position (abbr.)
 157 Hydriodic acid (chem.)
 158 Mental conception
 160 And others (legal abbr.)
 161 Course V (profession abbr.)
 162 A puffin of Hawaii
 163 Side of stage (abbr.)
 164 Rule of action
 166 Direction* (abbr.)
 167 Consumed
 168 Tropical tree in muddy places
 174 British decoration (abbr.)
 175 City in central Spain
 177 Xylophone-like musical instrument
 179 Trunks of human bodies
 182 Hinted
 184 Set or clique (Scot.)
- 185 Time epoch
 186 Times preceding events
 187 Garden vegetable
 188 State of containing more solute than needed for saturation
 190 S.A. plant madder family
 191 Connective
 192 Mark that means failure*
 193 Representative (abbr.)
 194 Fashioner
 196 N.Y.C. subway division
 197 French connective
 198 Manganese
 199 Vanadium*
 200 M. — Course II*
 201 Lieutenant (abbr.)
 202 Kernel of some fruits
 204 Silicon
 205 By the way (Lat. — Dictum)
 206 Phosphorus symbol*
 207 Hydrogen symbol*
 208 Fabled giant
 212 Spread for drying
 215 Island off Venezuela
 218 Football team
 223 Mark of credit*
 224 Prizes Hercules won
 226 Argon symbol*
 227 Clatter noisily again
 229 Artificial language
 230 Hot (Ital. fem.)
 231 Compass point
 232 Egg's enclosure
 233 Part of abbr. for New England athletic association, combined with 234h, 235h*†
 234 Same as 233h
 235 Same as 233h
 236 Hollow cut or nick
 237 B-U: Heat unit*
 238 Civil Engineering Course*
 239 Uranium symbol*
 240 Boston's fish
 241 Slight hurried lunch
 242 System weights and measures
 243 Ring (Sp. Pres. 2d per.)
 244 One who ensnares
 249 Socks of cotton silk
 252 Inhabitants Near East Peninsula
 259 Enzyme
 260 Abbr.: schedule
 261 Here (Lat.)
 262 Sufficient (poet.)
 263 Caustic base
 264 Dire necessity (comp. word)
 265 Re artificial light
 266 Letter addition (abbr.)
 267 Child (slang)
 268 Compass point
 269 Things (Lat.)
 270 Capacity measure* (abbr.)
 271 Dialect of Siamese
 272 Science (abbr.)
 273 Metalliferous rock
- 274 Waterfall
 275 Titanium symbol
 276 Iodine symbol*
 277 2d vars. crew nickname
 279 Fall Smoker to start things† (abbr.)
 280 Common French ending
 281 Thallium symbol
 282 Small weight (abbr.)
 284 French: there*
 285 Indium symbol
 286 High tension (abbr.)
 287 British coin system (abbr.)
 288 Fifty*
 289 Holland Commune
 290 Cyprinoid fish
 291 M.I.T. athletic award*
 292 Our mugs of conviviality
 296 Course VI (abbr.)
 297 Finis (geom.)
 298 Midwestern state (abbr.)
 299 Track officials
 302 161h and this: Course X*
 303 Another letter of 237h*
 304 Oxygen symbol*
 305 Electrified particle
 307 Temperature abbr.* (U. S. system)
 308 Course I graduate (abbr.)
 309 Course XVI major subj.
 312 Swiss canton
 313 Iroquoian Indians
 315 Satiric
 320 Trig. functions (pl.)
 327 Inspects
 333 Re sound
 334 Newts
 335 Latin "is"
 336 State, Bismarck capital (abbr.)
 337 Portion of
 338 Separate fine from coarse
 339 White and black color
 342 Catch a glimpse of
 343 Wider
 345 Greek "T"

VERTICAL

- 1 Calcium symbol
 2 American common weight (abbr.)
 3 No. Jersey community (dial. abbr.)
 4 Half of the Bible (abbr.)
 5 Language course
 6 Sloth
 7 Popular national radio system
 8 Mark of deficiency*
 9 U. S. northern neighbor
 10 Amphibious rodent we love
 11 Plural suffix*
 12 Force (Lat.)
 13 Atop of
 14 King of Bashan
 (Continued on page 454)

THE INSTITUTE GAZETTE

PREPARED IN COLLABORATION WITH THE TECHNOLOGY NEWS SERVICE

Political Arena

THIS spring, as is the perennial custom, Technology Alumni cast ballots for officers of the M.I.T. Alumni Association, for term members of the Corporation, for members of the National Nominating Committee, and for class representatives on the Council.

C. George Dandrow, '22, was elected president of the M.I.T. Alumni Association for the year beginning July 1, 1948, with Orville B. Denison, '11, as vice-president for a two-year term. Hugh S. Ferguson, '23, and Allan Latham, Jr., '30, were elected to the Executive Committee for two-year terms. Term members of the Corporation, elected by the Alumni Association for five-year terms, were: Thomas D'A. Brophy, '16, Raymond H. Blanchard, '17, and Thomas H. West, '22.

Elected to serve on the National Nominating Committee are: Minot R. Edwards, '22, (*District 3*); John S. Williams, Jr., '22, (*District 6*); and Thomas G. Harvey, '28, (*District 7*). Classes whose numerals end in four and nine also elected representatives to the Council; in each case the person nominated was elected since there was but one nominee for each class representative.

Catechizer

ONE hundred and one members and guests were registered in attendance at the 262d meeting of the Alumni Council in the Campus Room of the Graduate House on Monday, April 26, with Raymond H. Blanchard, '17, President of the Alumni Association, in the chair. Thomas H. Pigford, graduate student in Chemical Engineering, was introduced to Council members by Avery A. Ashdown, '24, Associate Professor of Organic Chemistry, who also commented on campus scenes to adorn the Campus Room. Of eight photographs to be hung, those of the University of Cambridge, University of Toronto, and Dartmouth College are already installed.

After acceptance of the minutes of the meeting of March 29, Charles E. Locke, '96, Alumni Secretary, stated that, in addition to those previously reported, four alumni and staff members had made visits to five alumni clubs between February 18 and April 23. Changes in class affiliation were made for 26 men who wished to be identified with their original class after studies were interrupted by war service. Nominations for advisory councils were submitted by Professor John B. Wilbur, '26, and a slate of committeemen, presented by the Personnel Committee, was elected. William W. Garth, Jr., '36, Alumni Day chairman, reported that speakers for the symposium "Logistics of Peace" had given definite acceptance and other plans for Alumni Day were progressing smoothly.

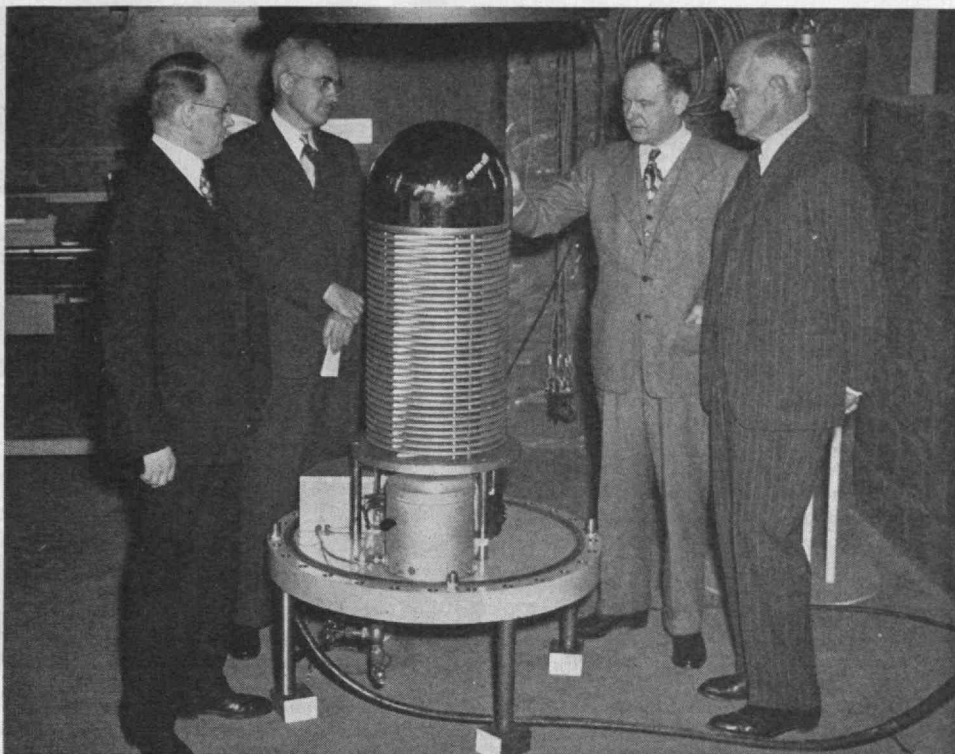
President Blanchard then introduced William B. Maley, '48, chairman of the Senior Week Committee, who made an excellent presentation of the program of student activities for the week of graduation. Upon being

called on to brief Council members on recent developments at M.I.T., Robert M. Kimball, '33, Administrative Assistant to the President, spoke on the groundbreaking ceremonies for the Charles Hayden Memorial Library; the combined program of study of M.I.T. and several liberal arts colleges in which students receive bachelor's degrees in arts and science for a five-year study; the \$70,000 grant from the American Cancer Society; the plans for the May 1 Open House activities; and the work of the M.I.T. student group of the National Student Association which is sponsoring a program of summer study at M.I.T. for 80 foreign students.

President Blanchard then called on Professor Warren K. Lewis, '05, chairman of the Committee on Educational Survey, to outline the work of his committee in making a complete survey of educational methods at the Institute. Dr. Lewis traced the development of engineering education in the United States, giving special emphasis to the changes which have taken place during the past 50 years. Half a century ago, M.I.T. was training about half the engineers and scientists of the country. Today, by contrast, many other schools have entered the technical field and the Institute trains only about one or two per cent. The prestige and facilities for graduate study at M.I.T. have tended to stress the Institute's role in research and in training men for research positions, and this program has been accelerated by the substantial growth of industrial and research laboratories since World War I. Especially from government, there is great pressure to have the Institute continue sponsored research projects. To the extent that research stimulates and advances an atmosphere of intellectual inquiry, it is desirable in the training of students. On the other hand, Dr. Lewis pointed out that the demand for general engineers and scientists continues at a high level, and the best training for such individuals is not necessarily the best for those who will continue research activities.

Employing a catechistical approach, Professor Lewis invited comments from Alumni on the general problems confronting the Committee on Educational Survey and proposed five questions for discussion as follows: (1) To what degree do the Alumni want M.I.T. to undertake changes in its educational program to meet the changing demands for graduates and how rapidly should the changes be made? (2) Why do many Alumni send their sons and grandsons to schools other than M.I.T., particularly for undergraduate work? (3) Does the fact that Alumni do not send their sons to M.I.T. mean that they feel the Institute should become a graduate school only? (4) Since the problems of modern life result so largely from the impact of engineering and science on society, what responsibility should the Institute assume in the training of men to solve them? Should this responsibility be left to the arts colleges and universities? (5) What is the proper place of intellectual discipline at M.I.T.? What is a proper student load? What insistence should there be on continued and sustained educational effort by the student?

In usual reading order: Edward L. Moreland, '07, Executive Vice-President, and George R. Harrison, Dean of Science, listen to John G. Trump, '33, Associate Professor of Electrical Engineering, enumerating to Arthur T. Lyman, President of the Massachusetts Division of the American Cancer Society, some of the features of a recently designed 2,000,000-volt generator for the production of x-rays for medical research.



Alumni Day—June 12

EACH year, one day assumes extraordinary importance in the lives of Technology Alumni. On that day—Alumni Day which, this year, will be on June 12—former students from all parts of the country (and even beyond the borders of the United States) return to Cambridge to renew old acquaintances and to form new ones; to visit the Institute and to note changes since their last visit; to relive old times with a favorite professor or a class buddy.

The Institute will be open at 8:30 for registration of Alumni, Alumnae, and guests in Building 10 overlooking the Great Court. From 9:00 to 12:30 provision has been made for tours of the M.I.T. Buildings, including laboratories, and the new Senior House and Hayden Memorial Library which are now under construction. Rain or shine will make no difference at luncheon which will be served under canvas, in DuPont Court, with special reunion tables for the 50th-(1898) and 25th-(1923) year classes.

In the afternoon, Walker Memorial will be the scene of the symposium "Logistics of Peace." As symposium chairman, Norman J. Padelford, Professor of International Relations at M.I.T., and former adviser to Secretary of State Byrnes, will introduce outstanding speakers. Clarence D. Howe, '07, Canadian Minister of Trade and Commerce, will discuss matters of defense and international political co-operation; Robert T. Haslam, '11, Vice-President of Standard Oil Company of New Jersey, will outline the role of raw material in world peace; and Richard M. Bissell, Jr., Professor of Economics at M.I.T., and Director of Operations, Economic Co-operation Administration, European Recovery Program, will deliver a paper on the economic foundations of a viable peace.

In the evening, at 7:00 P.M., the Hotel Statler in Boston will resound once more to the strains of "A Stein Song," "Take Me Back to Tech!" and other old favorites.

Souvenir steins of new design will be initiated into use, of course. President Compton, in fitting conclusion to a memorable occasion, will deliver his annual message to Alumni on the year's progress at M.I.T.

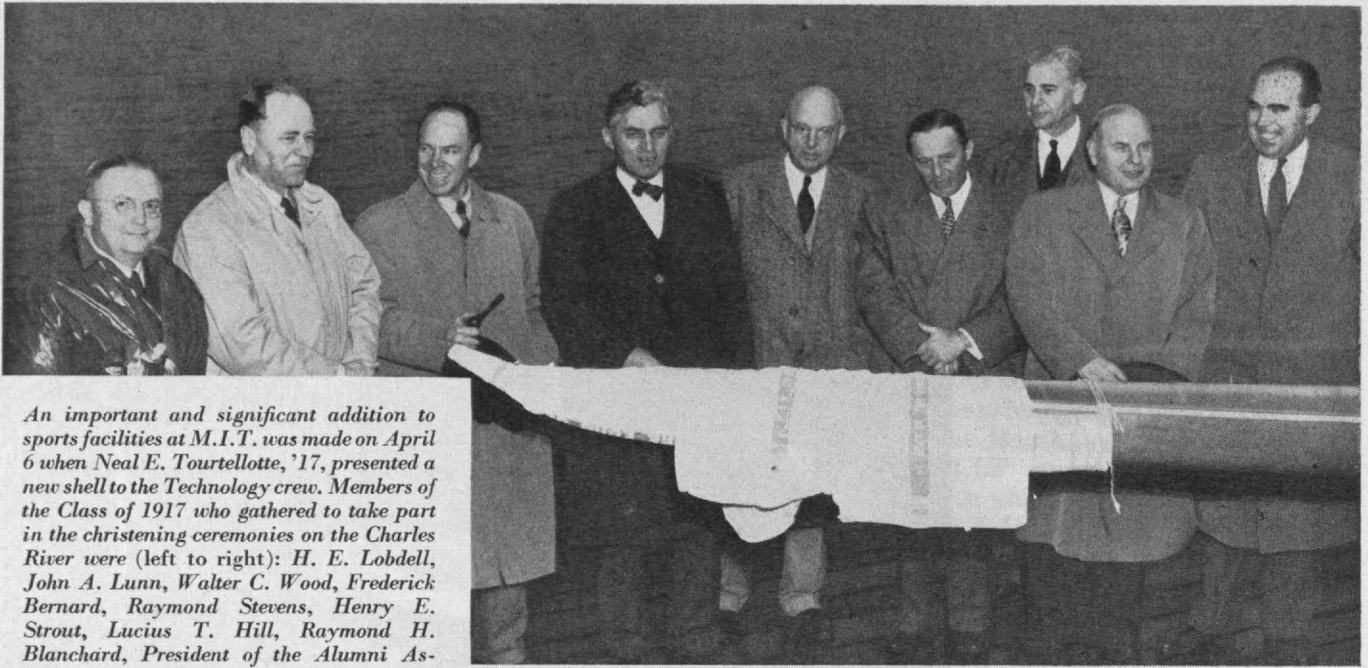
Attack on Cancer

STUDIES of the physical properties of supervoltage x-rays up to 5,000,000 volts will be undertaken at the Institute under a grant from the American Cancer Society, according to a recent announcement by George R. Harrison, Dean of Science.

The grant of \$70,000 was presented to M.I.T. by Arthur T. Lyman, President of the Massachusetts Division of the American Cancer Society. It will enable John G. Trump, '33, Associate Professor of Electrical Engineering, who is in charge of the research, to add to the Institute's facilities a compact, flexible 2,000,000-volt generator to study techniques of applying highly localized doses of x-rays deep within the body. The Institute's pioneering program in the development of Van de Graaff-type generators, for producing medical x-rays up to several million volts, was recorded in an article by Dr. Trump in the December, 1947, issue of *The Review*.

The grant was presented to the Institute in the presence of a group of administration officers and members of the Faculty, including: Harold L. Hazen, '24, Head of the Department of Electrical Engineering; Professor John R. Loofbourow, and Henry S. Bennett, Assistant Professor of Cytology, both of whom are carrying on research in the field of biology; and Dr. Trump whose research will be advanced by the fund. In making the presentation, Mr. Lyman said:

The current campaign of the Massachusetts Division of the American Cancer Society is vital to the support of the type of research Dr. Trump is carrying on, and only through such basic studies can these projects go forward. Science and surgery are working in a concerted effort to determine the cause and cure



An important and significant addition to sports facilities at M.I.T. was made on April 6 when Neal E. Tourtellotte, '17, presented a new shell to the Technology crew. Members of the Class of 1917 who gathered to take part in the christening ceremonies on the Charles River were (left to right): H. E. Lobdell, John A. Lunn, Walter C. Wood, Frederick Bernard, Raymond Stevens, Henry E. Strout, Lucius T. Hill, Raymond H. Blanchard, President of the Alumni Association, and, at the extreme right, Ralph

T. Jope, '28. It came as a surprise to Mr. Jope that the shell was named in his honor, in recognition of his many years of faithful service as secretary of the Advisory Council on Athletics. Mr. Tourtellotte was unable to be present at the christening at which Mr. Lobdell officiated.

of cancer. No man knows when the cause will be found, but as long as the rapid strides of recent progress are continued, the dawn of the day for the discovery of the cause of cancer will not be too far beyond the horizon. The results of the studies to be undertaken at the Institute, plus new techniques in chemistry and surgery, could possibly end the scourge of cancer, the nation's second greatest cause of death.

In accepting the grant for the Institute, Edward L. Moreland, '07, Executive Vice-President, emphasized the importance of research on the further understanding and control of cancer.

Fellowships for Leaders

DEVELOPMENT, for positions of higher responsibility, of young executives of outstanding capacity, proved managerial ability, and demonstrated awareness of the social effects of industry is the objective of a three-year program of research at the Institute. The educational program for a group of outstanding young business executives is made possible by a grant of \$225,000 to M.I.T. by the Alfred P. Sloan Foundation.

Beginning in the summer of 1949, the grant provides for Sloan Fellowships to young business executives who show outstanding promise for leadership in their own companies and for service to our industrial society. The young men selected will come to the Institute on leave of absence from their employing companies for a year of graduate work in the field of business administration and economics, and will have an opportunity to become familiar with the fundamental problems with which business management deals. The new project will be a co-operative activity of the Department of Business and Engineering Administration and the Department of Economics and Social Science. Gerald B. Tallman, Associate Professor of Marketing, has been appointed director of the program.

In announcing the grant, Alfred P. Sloan, Jr., '95, chairman of the board of General Motors, said:

The administrators of business have always played an important role in the health and stability of our industrial society. It is our hope that through this fellowship program the thinking of a group of future business leaders may be broadened to provide to the fullest extent possible a recognition of the interdependence of the industrial and social structure within which they will work and upon which their decisions and contributions will have an effect.

It has long been my feeling that a technical training provides an excellent foundation for a career of industrial leadership, but there needs to be added to the firm discipline of engineering and sciences an exposure to the human organizational problems within business and between business and an industrial society. It is the goal of this fellowship program to select men who have but recently achieved positions of managerial responsibility to provide them with a year's educational experience which will introduce them to many phases of business activities beyond their own past experience and will provide them with an opportunity and stimulation to develop an understanding of their implications.

We believe that Massachusetts Institute of Technology, with its rich technical background and well-developed programs in business management, industrial relations, and economics, is in an unusually favorable position to undertake this educational program. The records of achievement and service made by men who participated in this fellowship program before the war are outstanding and have given us great faith in the productiveness of such an educational experience. It has been most rewarding to the Foundation to have a part in the development of this group of men and to anticipate the continuation and expansion of the program.

Successful Open House

MORE than 30,000 visitors and friends of Technology students visited M.I.T. on Saturday, May 1, in the first Open House exhibit since before World War II. Visitors were able to see numerous mechanisms and methods leading to technological advances, but also had opportunity of observing sports and student life generally at the Institute in a full day's program of events.

BUSINESS IN MOTION

To our Colleagues in American Business . . .

It is an American custom, indeed a tradition, to render public service when one is able to do so. Revere has engaged in such activities, as do all companies in accordance with their abilities and opportunities. We take no particular credit for such work. However, we do feel that it is appropriate to tell you about a new project which may not only be justly described as in the public interest, but which has somewhat of a commercial aspect too.

We refer to the Revere Quality House Institute. This was started by Revere in February. Its object, briefly, is to see what can be done to give home buyers the assurance that they are obtaining value received in materials and construction, and are in addition obtaining those intangibles that add little or nothing to cost but contribute immeasurably to the joy of living — convenience, beauty, adaptation to the site, orientation, privacy, and so on.

To obtain really fine housing in any price range there are two main requisites. One is the establishment of standards of materials and workmanship. The other is professional — the services of architects for original designs and control of quality. Through the Institute we believe both the standards and the services of architects can be made available to builders and buyers of moderate-priced homes. To test out the methods that have been proposed, the Institute plans during 1948 to collaborate in the construction of eight houses in as many sections of the country, each house to be put up by a different architect-builder team.

This is entirely an Institute operation. Revere is building no houses. Though Revere provides the funds to support the Institute through its formative years, it asks of

the Institute only that it determine how much quality and comfort can be provided per housing dollar, and how to assure the buyer that he is getting it. In order to avoid any possibility of bias, Revere sought The Architectural Forum as co-sponsor. This is a professional publication deeply interested in housing, and well regarded by both architects and builders. It has assumed the responsibility of the new organization. Revere does not, and will not, control the Institute.

What, then, is Revere getting out of it? For the present, very little. Remember, only about 1% of the cost of the average medium-priced home is represented by the cost of copper and copper alloys required for long, trouble-free service. That includes not only such items as flashing, gutters and downspouts, water and heating lines, termite shields, but also hardware. Obviously, profits from the sale of copper and brass for the eight houses to be built in 1948 by the Institute will be negligible. Taking the long view, however, we believe that through the Institute quality standards will be established for all materials, including metals. The more homes built

to those standards, the more copper and brass will be sold by the entire copper and brass industry, including Revere. This will benefit everybody, and especially those who buy and live in houses built to Institute standards, because trouble always costs more than sturdy, long-lived materials. It is our hope that eventually the Institute will become self-sustaining and will need no more financial help. Whereupon Revere will have the satisfaction of having engaged in a worthy endeavor that was also a good investment.



REVERE COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

☆ ☆ ☆

Executive Offices:

230 Park Avenue, New York 17, N. Y.

CURTIS "LO-FRICTION" UNIVERSAL JOINT Sets New "Standards"



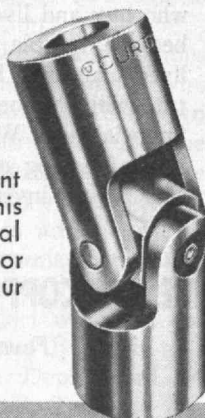
NEW LO-FRICTION
CENTER BLOCK

Actual photo shows NEW CURTIS LO-FRICTION Universal Joint at top (driving end) and a Curtis Standard Joint at bottom (driven end) in dynamometer test with load and angle increased beyond safe limits. NOTE: Standard joint shows excessive heating — approaching failure — while NEW LO-FRICTION joint ran cool and handled overload successfully.

FRICTION — The bug-a-boo in offset drives for power transmissions has been greatly reduced, effectively, yet simply, in this NEW CURTIS LO-FRICTION UNIVERSAL JOINT now available for industrial applications.

Note that two (2) grooves on each of the four (4) bearing surfaces of the center block break each surface into four smaller areas making sixteen bearing faces. By reducing the size of frictional areas, wear is more evenly distributed, lubrication is transmitted more effectively, and friction heat, or kinetic energy, is dissipated, thus increasing joint life and efficiency tremendously.

After many tests, all resulting in the same answer, Curtis has made patent application and is now ready to supply this new LO-FRICTION industrial universal joint in sizes from $1\frac{1}{4}$ " up, either single or double, or in special joints made to your specifications.



Write Dept. B-5

**@ CURTIS UNIVERSAL
JOINT CO. INC.** SPRINGFIELD
MASS.

THE TREND OF AFFAIRS

(Concluded from page 428)

exposed, the survivors being permitted to propagate. After 14 generations, this elite corps had more than twice the resistance to DDT of regular stock, the average mortality for unselected flies being 69 per cent, and for the specially bred stock, 34 per cent.

As long ago as 1922 it was noticed that red-scale insects, which had acquired some degree of resistance to hydrocyanic gas, were also more resistant than usual to methyl bromide, ethylene oxide, and a number of other substances not usually classified as nutritious. Similarly, the house flies selected only for their indifference to DDT required about twice as much of several poisons, such as chlordane, rotenone, and pyrethrin — plus five per cent piperonyl cyclonene to achieve the same mortality rates as ordinary strains. The implication, of course, is that similar results may eventually occur under natural conditions, if they are not already under way.

Resistance to poisons is no novelty in nature, being found also among mammals, reptiles, and fish. Some types of constrictor snakes feed on fanged snakes without injury, and a still more remarkable case is a Brazilian skunk which preys on the fer-de-lance and is indifferent to its otherwise deadly venom.

While not involving poisons, there are many examples in agriculture of how selection and mutation can upset man's carefully arranged balance between plants and their diseases. Stem rust of wheat is caused by a fungus known as *Puccinia graminis tritici*. But closer examination reveals that this species is composed of a large and changing number of races. As of 1947, 189 races had been described, but the population shifts. Old races sometimes disappear from the scene, or may change their identifying characteristics, and new races will evolve.

Because of its apparent resistance to stem rust, the variety of spring wheat known as Ceres became popular in the middle 1920's and soon was planted to most of the wheat acreage in the Dakotas, Minnesota, and parts of Canada. About two years after it was introduced, a new race of stem rust (Race 56) was found in Nebraska and Iowa, and within six years it had become the most frequently found type. But the Ceres wheat, although growing well in the presence of the stem-rust races prevalent at the time of its introduction, suffered heavily in the epidemics of 1935 and 1937. The next widely used spring wheat used in the Great Plains area was Thatcher, introduced in 1934. It stood up well during the 1935 epidemic, a factor which gained it rapid favor. By 1939 it was being grown on an estimated 14,500,000 acres in the United States. By 1944, however, the acreage had been reduced to about 4,500,000, for while resistant to stem rust, Thatcher is susceptible to leaf rust. Many other varieties have been tried since, each with its distinctive inbred resistances to disease, but all suffering from the difficulty that they can be selected to withstand only diseases already in existence. Although the agricultural research stations are now considering new and emerging strains of fungi, as well as those dominant in the fields at the moment, the most that can be reasonably hoped for is that we shall obtain a longer head start against the diseases of the future.



each half drives this

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Provides positive control at levels as low as $\frac{1}{2}$ microampere. Operates direct from photocells, thermocouples, resistance bulbs, or any suitable electrical circuit. Non-chattering magnetic contacts handle up to 10 watts at 120 volts.



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tion consult our representatives, or write ... Weston Electrical Instrument Corporation, 617 Frelinghuysen Avenue, Newark 5, New Jersey.

**SENSITROL*—A registered trade-mark designating the contact-making instruments and relays manufactured exclusively by the Weston Electrical Instrument Corporation.

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NEW ORLEANS • NEW YORK • PHILADELPHIA • PHOENIX • PITTSBURGH • ROCHESTER • SAN FRANCISCO • SEATTLE • ST. LOUIS • SYRACUSE • IN CANADA, NORTHERN ELECTRIC CO., LTD., POWERLITE DEVICES, LTD.

ARTIFICIAL COSMIC RADIATION

(Concluded from page 440)

as the mass of the particle (proton, deuteron, or alpha particle) increases. In a sense, the synchro-cyclotron is a half-breed between the cyclotron and the synchrotron. A large number of such machines are now under construction, covering the range of from 100 to nearly 300 million electron volts.

The 300-million electron-volt synchrotron now nearing completion at M.I.T. is the highest energy machine now in existence. It can accelerate electrons up to 300 million electron volts where the mass of the electrons has increased 600 times. When the electrons impinge on the tungsten target, x-rays of all energies up to the 300-million electron volts are formed and emerge in a very narrow cone of less than half a degree. Each pulse of x-rays lasts for less than a millionth of a second.

To produce these high-energy particles, a 55-ton magnet is required. This is a particularly costly magnet and difficult to build, for it must be made entirely of transformer steel, each sheet of which is only 0.014 of an inch thick. To supply energy to the magnet requires a large capacitor bank and an electronic switch. The capacitor stores the energy obtained from the power mains until it is released, by the electron switch, to the magnet. The capacitor for the M.I.T. synchrotron is one of the largest in the world, and is rated at 33,000 kilovolt-amperes, or 800 microfarads at 15,000 volts. A single cycle of current (6,000 amperes) flows at a peak voltage of 15,000 volts. The circulating power in the magnet is, therefore,

nearly 100 million volt-amperes, or equal to the power of 2,000 broadcasting stations of 50 kilowatts each. The electrons are accelerated in a specially built vacuum tube made of high-quality steatite, developed by William M. Shakespeare, Jr., '42, at M.I.T., and having a diameter of about eight feet. The cost of the installation is approximately \$500,000. The development required a scientific staff of 10 physicists and engineers over a period of two years. The senior men on the M.I.T. synchrotron were: J. Earl Thomas, Jr., Assistant Professor of Electrical Engineering, and Joe S. Chark, '37, Reginald V. Harris, Isaac G. Swope, '27, Philip A. Stowell — all of the Division of Industrial Cooperation. The project was supported by the Office of Naval Research.

It is too early to predict what the new superaccelerators will do. They represent the first effort by man to reach artificially into the energy levels of uranium fission and the creation of mesons. By controlling the source of the particles and their energy, and by having available much higher numbers of particles than were available in natural cosmic radiation, it is hoped to study in detail the behavior of the nucleus and of mesons in these high-energy ranges, and to gain, thereby, experimental knowledge on which to extend our understanding of the structure of the universe. But even with these new machines, man has still a factor of a billion to go before he can compete with nature. Homemade cosmic rays will, therefore, continue to remain but puny efforts, so far as peak energy is concerned, but they will undoubtedly contribute greatly to our knowledge because of the control which the experimenter has over them.



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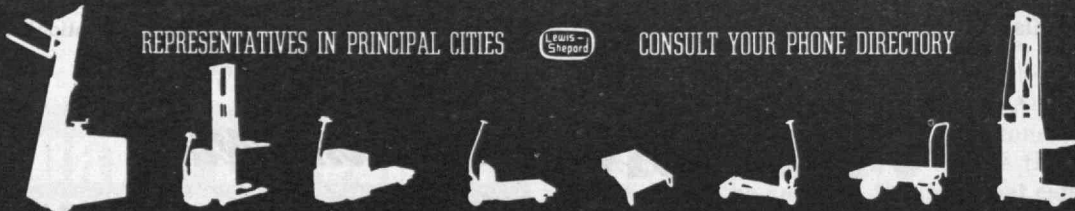
PRODUCTS INC.

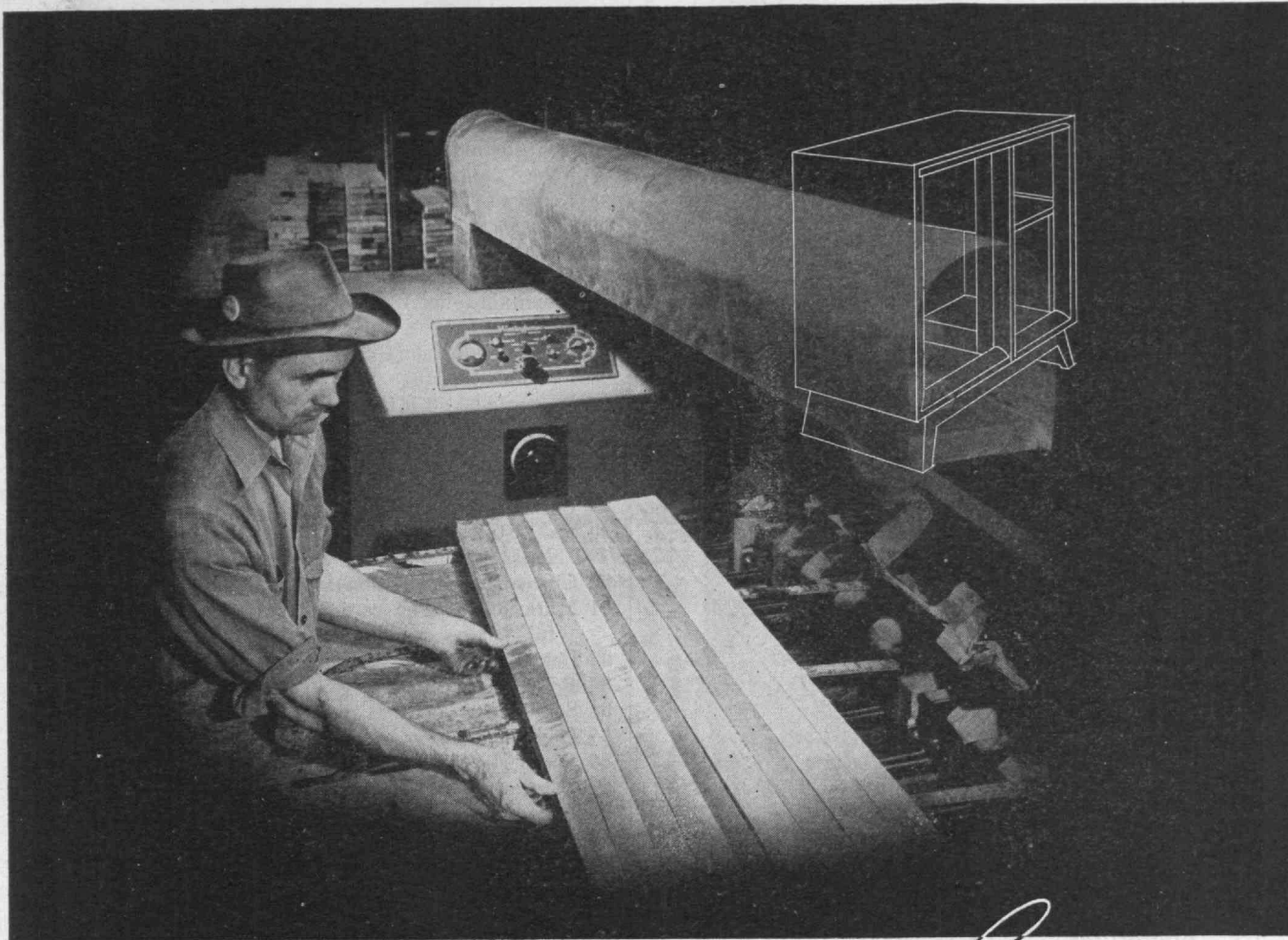
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THE GLUE THAT BINDS NOW DRIES IN

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Constant Current

3 Regulators (Static Type)

1 Hevi Duty Precision Electric Heat Treating furnaces are built in a large variety of types and sizes — for many heat treating operations — with temperature ranges to 2500° F (1371°C). They are standard production equipment in many national industrial plants.

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DRY TYPE TRANSFORMERS — CONSTANT CURRENT REGULATORS
MILWAUKEE 1, WISCONSIN

TECHNOLOGY CROSSWORD PUZZLE

(Continued from page 445)

- | | |
|--|---|
| 15 Latin "of" | 87 What the Frosh did to get "dx" |
| 16 Gold (heraldic) | 88 Student Activities Building |
| 17 Bone | 89 In control |
| 18 Required for M.I.T. degree | 90 Degrees F. or C. (abbr.) |
| 19 Former Mexican president | 91 Technology Y.M.C.A. |
| 20 Mountain (abbr.) | 95 Alumni Association welcomes these for M.I.T. bequest |
| 21 English article* | 97 Precept formulated to give victory over Japanese |
| 22 Baseball position (abbr.) | 101 Joiners |
| 23 Language course | 103 Anthology (abbr.) |
| 24 We write 39 after this† | 107 Greek "B" |
| 25 Another electric current | 109 Organic chem. suffix |
| 26 Right (abbr.) | 118 Fearful of danger (Fr.) |
| 27 Prefix: two or twice | 120 Illuminated beforehand |
| 28 Adj. suffix denoting "of" | 125 Compass point |
| 29 Six states including Mass. (abbr.) | 129 That is (Lat. abbr.) |
| 30 Current years era (abbr.) | 130 Percentum (abbr.) |
| 31 Mark means "be careful"* | 131 White metal for coins |
| 32 Potassium symbol* | 133 Large pine family tree |
| 33 Printer's measure | 134 Brazilian sunfish |
| 34 Sodium symbol | 141 Mark, still passing* |
| 35 Day's sight (abbr.) | 142 Summers (French) |
| 36 Water (Lat. abbr.) | 145 Japanese coins |
| 37 Lutecium symbol | 146 Celestial body |
| 38 French article | 148 Tech's student store |
| 40 Dawn goddess (Gr. myth.) | 149 Malay boat |
| 42 Provides with edge | 151 Boast or exult |
| 43 Gracious donor of present M.I.T. buildings | 153 Tech men at a dance <i>sans femmes</i> |
| 44 Our honored chief executive | 159 King of Judah |
| 45 Mohammedan caravansary | 160 Ostrich-like bird |
| 46 A pouch | 165 Marry |
| 47 To crush (var.) | 167 Wing |
| 48 Nitrogen symbol* | 169 Clad informally |
| 50 Royal* (British abbr.) | 170 Lowest point |
| 52 Musical Clubs Key Honorary | 171 Weight* (chem. abbr.) |
| 54 Spawn | 172 To rent again |
| 56 English possessive | 173 Outwardly manifest |
| 59 Gives M.I.T. its beautiful water front | 176 East Prussia (abbr.) |
| 60 Senior Honorary | 178 Note of the scale |
| 62 Takes out (print.) | 180 About or concerning |
| 66 Parts of a cent | 181 State in the cotton area (abbr.) |
| 67 To latch again | 183 Diameter symbol* |
| 70 Electric battery terminal | 184 Carbon symbol* |
| 73 Important chemistry course | 187 3.14159 . . . |
| 74 Undergraduate writes this for Masque | 189 Temperature symbol* |
| 75 Chief sophomore mathematics course | 192 Strainer (chem.) |
| 78 State with fishhook cape | 195 Greek letter |
| 80 Very black | 202 English dramatist (1786-1872) |
| 81 Chronological record of our student newspaper | 203 Arts of industries and manufactures† |
| 84 Stingers | 206 Hebrew letter |
| 85 Den | 209 Tech team, usually good |
| 86 Electric voltage term | 210 Course IV graduate |
| | 211 Bareness |
| | 212 M.I.T. annual yearbook |
| | 213 Tech Alumni general professional title (pl.) |

(Concluded on page 456)

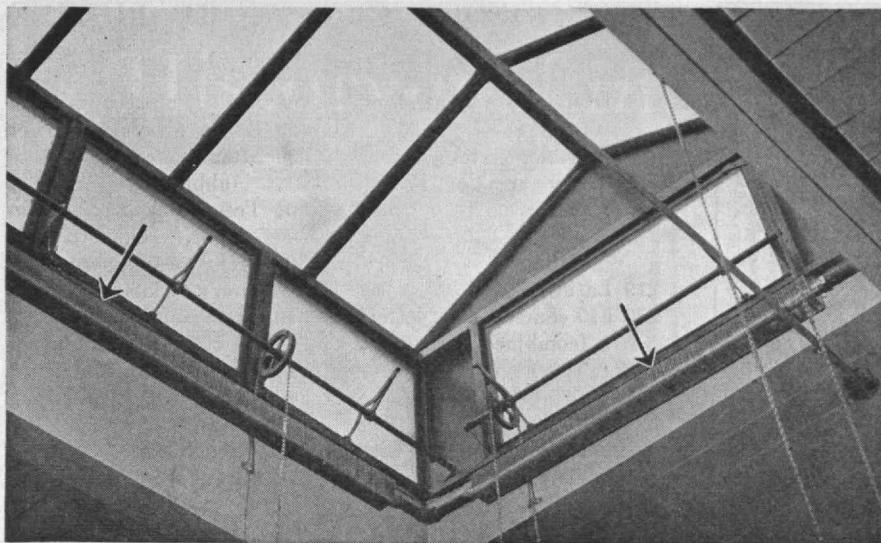


Illustration shows how Webster Type WI Radiation (indicated by arrows) is installed around skylight

Warm Spot in January Cold Wave

Hundreds of formerly "hard-to-heat" buildings . . . places that used to be cold even in normal winter weather . . . were oases of warm comfort during the January-February cold wave, thanks to post-war Webster Type WI Extended Surface Radiation for hot water and two-pipe steam heating service.

Webster Type WI Radiation can be put where the heat is needed — along the wall, close to the floor, behind benches, and in a continuous line in overhead locations such as skylights in which it was the former practice to use pipe coils.

Using modern materials, copper tubing and aluminum fins, Type WI Radiation provides better than a square foot of heating surface for each $\frac{1}{2}$ lb. of weight.

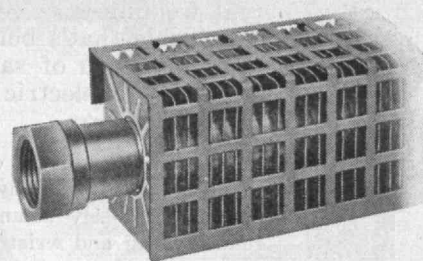
Take steps now while the memory of your cold weather difficulties is fresh in mind. See if Webster Type WI Radiation can be used to turn your cold spots into areas of next winter comfort. Good delivery now.

WARREN WEBSTER & CO., Camden, N. J.
Representatives in Principal Cities :: Est. 1888 :: In Canada: Darling Bros., Limited, Montreal

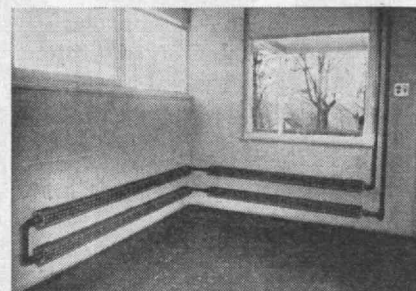
Webster

HEATING

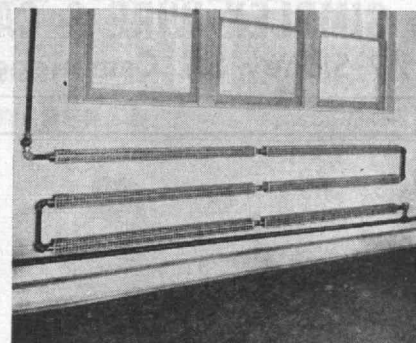
**Wide Flexibility
To Meet Varying
Installation Requirements**



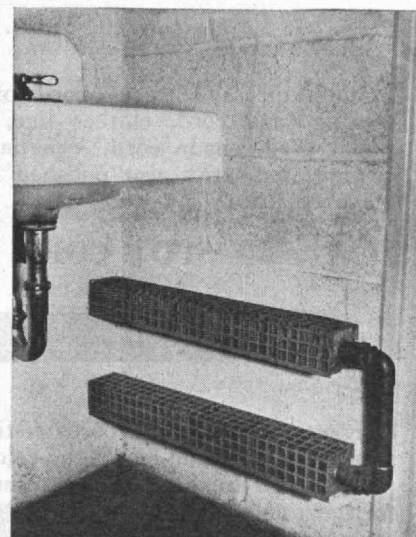
End view of Webster Type WI Radiation



Installation of Webster Type WI Radiation in Gardener's Cottage—hot water heating.



Three rows of Webster Type WI Radiation are sometimes used — View showing vacuum or vapor system installation.



Webster WI Radiation used under basin where vertical wall space is limited—hot water heating.

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Here's real welding-wise construction! It gives you a cable that's both flexible and tough. It assures you of savings in time, labor, and money on electric welding work.



Extreme flexibility is obtained by making conductors of many threadlike copper wires closely stranded together. It reduces drag and wrist fatigue and contributes to fast, efficient welding even in cramped locations.

Clean stripping is facilitated by a separator of soft cotton braid which does not bind the conductors nor hamper their flexibility.

Resistance to abrasion, moisture, grease, oil, and acids is furnished by a "cured-in-lead" jacket of Selenium Neoprene Armor. The jacket is not easily cut, will not support combustion, and provides insulation with essential electrical stability.

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TECHNOLOGY CROSSWORD PUZZLE

(Concluded from page 454)

- | | |
|---|--|
| 214 Drops down (Lat. legal form) | 295 Saint (French abbr.) |
| 215 Affirming statement | 299 End of a tapering object |
| 216 Valley area of French river | 300 Mountain belt state (abbr.) |
| 217 B----- Aires (Sp. ending) | 301 Transportation system abbr. — one letter* |
| 219 Latin* (abbr.) | 305 Prefix meaning equal |
| 220 640 course — one letter* (combined with 222v, 314v) | 306 Man's nickname |
| 221 Five* | 310 Latin connective |
| 222 640 course — another letter* (combined with 220v, 314v) | 311 Provided (conjunction) |
| 224 An established order† | 314 To finish 220v and 222v* |
| 225 They fit irons on horses | 316 Another neighboring state (abbr.) |
| 228 Maniacs | 317 Belonging to |
| 229 Director T.C.A. | 318 Part of abbr. for national collegiate athletic body*† (combined with 184v, 233h, 234h, 341v, 344v) |
| 240 Per —, each | 319 Metric weight (abbr.) |
| 245 Org. chem. alcohol termination | 320 Suffix of condition or quality |
| 246 Satisfactory (colloq.) | 321 Zero* |
| 247 Standing out prominently | 322 Arsenic symbol |
| 248 Eagerness for action | 323 Notary Public (abbr.) |
| 250 Irritation of the skin | 324 601 course* (abbr.) |
| 251 Plant's reproductive ovule | 325 Note well (Lat. abbr.) |
| 253 A canon | 326 Alumni magazine (abbr.) |
| 254 Unites with a base to form a salt | 328 Xenon symbol |
| 255 Profit or advantage | 329 Land measure 119.6 sq. yds. |
| 256 Iridium symbol | 330 Abbr. for student athletic governing body*† (combined with 318v, 291h, 341v, 344v) |
| 257 English article | 331 Our continent (abbr.) |
| 258 Slip off smoothly | 332 Europium symbol |
| 277 Glass center Switzerland | 340 Other letter 301v abbr.* |
| 278 Glass container (chem.) | 341 Same as 330*† (combined with 330v, 318v, 291h, 344v) |
| 282 Persian poet, first name | 344 Same as 330v*† (combined with 330v, 318v, 291h, 341v) |
| 283 Agreeable interest | |
| 288 Behold | |
| 292 Theater sign: full house | |
| 293 Weight measure as for coal | |
| 294 Greek letter | |

WHAT IS DEMOCRACY?

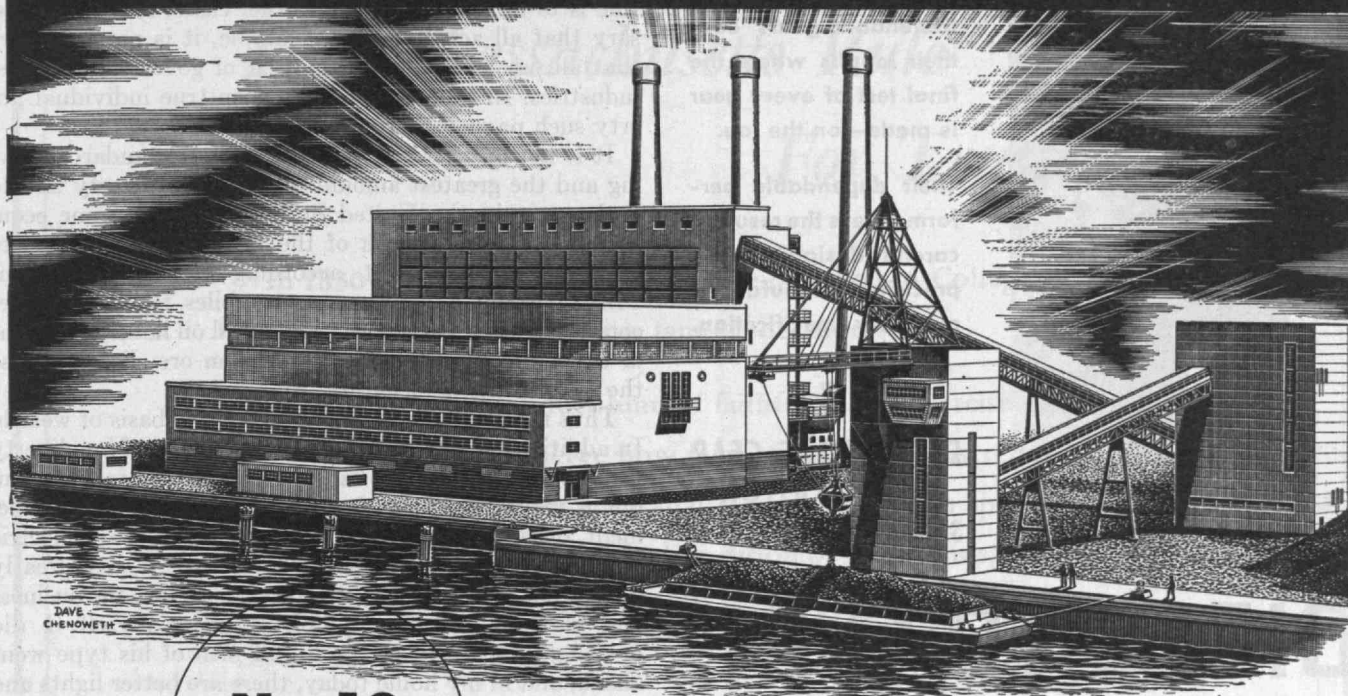
(Continued from page 434)

Under conditions of such chaotic change, any single plan is almost certain to be wrong. The only way to increase the chance of success is to have several plans, so that if one fails, another may succeed. The greatest chance of success occurs when each individual makes his own plan. This is the reason for individual liberty and the reason why individual liberty should be taken as the central principle of democracy.

This does not mean that the individual is to have freedom in everything. It is imperative that a sufficient amount of self-discipline be accepted by those who would enjoy the blessings of liberty. Nor does individual liberty mean that we are justified in confusing liberty with license, as happens not infrequently. In some cases, it is necessary that all act alike, and in such instances, complete freedom to follow individual whim is not tolerable.

(Continued on page 458)

History-making power stations



No. 10 Sewaren Station

**PUBLIC SERVICE ELECTRIC
AND GAS COMPANY, SEWAREN, N. J.**

ON the banks of Arthur Kill at Sewaren, N. J., a 300,000 kw station, one of the largest initial installations of its kind ever projected by a power company, is now under construction. This great new station of the Public Service Electric and Gas Company also marks another milestone, for here at Sewaren . . . for the first time in power station practice . . . steam will be generated at a temperature as high as 1050°F.

What this high steam temperature means in terms of economy is obvious when you consider that the three initial Combustion Engineering boilers will require 30 per cent less coal to produce a kilowatt hour of electricity than the present average for the system.

The marked advantage of high temperature has awaited metallurgical advances that would provide boiler and turbine designers with suitable materials. C-E was the first to design and build a boiler unit to operate at a steam temperature above 900°F. It is again first in the range above 1000°F.

The construction of Sewaren typifies the far-sighted program of expansion carried on by utilities generally — in this instance by Public Service Electric and Gas Company. For years Public Service has carried on an extensive planning program to provide new power sources in advance of actual need. As far back as 1928 the 155-acre site at Sewaren was bought with such expansion in mind, and today the vision that foresaw the coming industrial development is being verified dramatically.

The association of C-E with Sewaren and other history-making stations speaks for itself. The experience, special skills and advanced engineering that have brought about this association are available to you also, whether your steam requirements are large or small.



These three factors are the unwritten plus-values in every C-E contract —

Knowledge — to solve today's and tomorrow's, steam generating problems.

Experience — to interpret, from a world-wide background in every important industry, the specific needs of each installation.

Facilities — to manufacture complete steam generating units for every capacity, from 1000 pounds of steam per hour up to the largest.

B-195

COMBUSTION ENGINEERING

200 MADISON AVENUE • NEW YORK 16, N. Y.



Actions Speak Louder

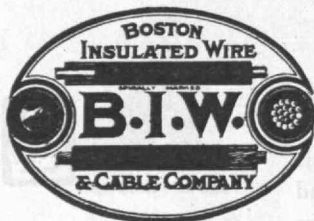
Diefendorf gears earn their laurels where the final test of every gear is made—on the job.

Their dependable performance is the result of careful designing and precision manufacture on every specification.

DIEFENDORF GEAR CORPORATION
Syracuse 1, New York

DIEFENDORF

GEARS



B. I. W. COAXIAL CABLES TRADE MARK CO-X

B. I. W. offers a complete range of types and sizes of coaxial cable for high frequency applications:

- Small flexible, low capacity (5 to 10 uuf/ft.) for internal wiring, patch cords, etc.
- Coaxial and Twin-axial weatherproof cables for antenna lead-in and other outdoor uses.
- Flexible standard synthetic insulated cables for electronic apparatus.
- Heavy duty, high power, flexible or semi-rigid transmission line.

All of the above can be supplied with special fittings and junctions for connections to panels or rigid lines.

**BOSTON INSULATED
WIRE AND CABLE COMPANY**
BOSTON 25, MASSACHUSETTS

WHAT IS DEMOCRACY?

(Continued from page 456)

For example, all must drive on the right, or all on the left, along the highways, and the majority should decide which rule is to be adopted. But in other cases, it is not necessary that all act alike. For example, it is not necessary that all pay taxes for the support of government-owned industries. In a democracy based on true individual liberty such payments would be optional.

It is not an accident that the highest standard of living and the greatest amount of individual liberty should both occur in the United States. Of course some economists think the wealth of the United States is due to natural resources. But according to that argument "Brazil would have more automobiles than any other country. For Brazil has vast potential oil lands, and some of the world's richest deposits of iron ore. Brazil is also the original home of natural rubber."¹²

Thus natural resources are not the sole basis of wealth. In addition, there must be economic liberty. Now liberty is not a privilege each of us wants for his own satisfaction, but is rather the basis for an ever expanding improvement of human welfare. When I was a boy, electric lights and power were being developed. I was greatly interested, and had complete liberty to go into the business and perhaps become a power magnate myself. I did nothing, but Thomas Edison and men of his type went ahead, and in my home today, there are better lights and power than my ancestors ever dreamed of. A little later, the automobile was being considered. Again, I was interested, and might have developed a billion-dollar enterprise myself. Again, I did nothing. Henry Ford and others developed the automobile, and today my modest car is a better vehicle of transportation than was owned by any king in history before my time. Thus, all my life, liberty has meant to me that other people were permitted to do for me things I had neither time nor ability to do for myself. If the liberty of any one of a dozen nations had been given to me, and if to others in this country had been given that liberty of the United States, I should never have known the difference.

And of the many freedoms enjoyed in America, probably the one that has meant most to me is freedom from excessive taxation. Not that my taxes ever amounted to much, my income was too small. But under the lower taxes of this country, men like Henry Ford could build great industries in a single lifetime, and the benefits of those industries could therefore come to me, instead of being reserved for my children or grandchildren, as undoubtedly would have been the case had I lived elsewhere, where opportunity for the individual was restricted.

This more rapid progress is characteristic of individual liberty. Advances come in other nations, but first they come in those nations where there is greatest freedom to exercise personal initiative. This is not only because people accomplish more where there is less hindrance, but also because the ablest people are attracted to places where the opportunities are greatest. We are, therefore, justified in concluding that the form of democracy which provides greatest individual liberty will always produce greatest progress, and, since the strength of a nation is measured mainly by new things, products, and ideas, that this type of democracy will ultimately prevail.

(Concluded on page 460)

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WHAT IS DEMOCRACY?

(Concluded from page 458)

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M.I.T. HOBBY SHOP

(Concluded from page 443)

which are available for their use, and are also required to abide by certain rules which have been established for their safety. Any member of the student body is eligible to become an ordinary member of the Hobby Shop. Those who demonstrate an enthusiasm and willingness to further the objectives of the Hobby Shop may be elected journeymen after having been an ordinary member for at least one term. After at least another term, journeymen may be elected to master-craftsmen membership. Master craftsmen are entitled to all rights

and privileges of the Hobby Shop, including election to the position of foreman, who is responsible for the safe and proper conduct of the workshop. The Hobby Shop is open to master craftsmen at any time, provided that at least two members are in the Shop; at no time is the Shop open to a single individual. Officers of the Hobby Shop include: a student foreman, assistant foreman, secretary, and treasurer, who are responsible for the management of the Hobby Shop.

The Hobby Shop is also open to members of the staff and to Alumni upon application and payment of annual dues of \$3.00, except that alumni membership is restricted to former Shop members. In thus opening the membership to others beyond full-time students at the Institute, it is understood that the facilities of the Shop are primarily for students; other members are expected to recognize the preferential status of students. Since the *raison d'être* of the Hobby Shop is recreational, projects are expected to be of the student's own choice and initiative rather than the "assigned" type or theses for which the student is expected to make use of the departmental shops.

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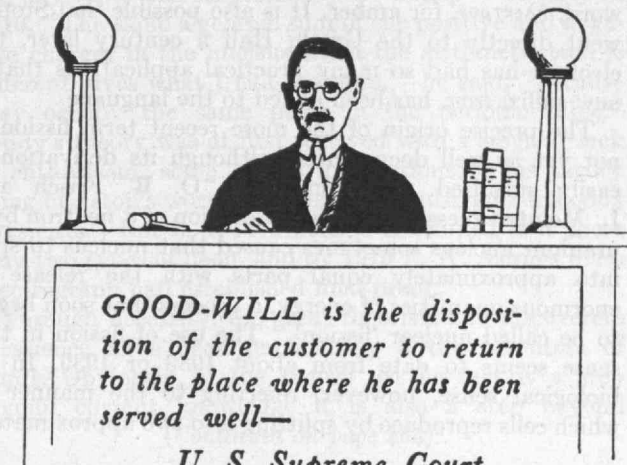
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THE SHADOWS OF SCIENCE

(Continued from page 432)

new cyclotron will travel 100 miles in one one-thousandths of a second from source to target, at a speed eight-tenths the velocity of light, or about 150,000 miles per second. At this speed their mass, under the laws of relativity, will increase about 50 per cent. The radio-frequencies by which they will be speeded up will therefore have to be modulated through frequency modulation over a frequency range of 28 to 17 megacycles per second. In this manner resonant frequency is maintained in synchronization with the resonant frequency of the flying protons."

"Historically," says White,¹¹ "a study of electric discharges through gases and the discovery of the electron mark the beginning of a new branch of physical science called 'modern physics.'" Credit for naming the electron appears to go to Dr. G. Johnstone Stoney of Dublin.¹² Stoney was not the first to believe in the atomic nature of electricity; Benjamin Franklin had suspected it, and Faraday had presented experimental evidence with his work on electrolysis. Whatever the value of Stoney's calculations on the average charge carried by an ion in solution, his reasoning was correct and only a crude value of Avogadro's number—the number of molecules in a chemical volume, or 22.4 liters—stood in the way of arriving at a more precise value of the elementary electric charge. But when J. J. Thomson¹³ proved pretty well that the cathode ray, investigated by Crookes in 1870,¹⁴ was made up of individual charged particles which Thomson wanted to call "corpuscles," Stoney's term "electron" prevailed. One version of its derivation is that Stoney built the word from *electr(ic)* and *on*. In turn, electric is derived, through the Latin *electrum*, from the Greek word, *ἤλεκτρον*, for amber. It is also possible that Stoney went directly to the Greek. Half a century later, the electron has had so many practical applications that a new suffix, *tron*, has been added to the language.

The precise origin of the more recent term fission is not yet as well documented, although its derivation is easily surmised. Says Smyth:¹⁵ "O. R. Frisch and L. Meinter guessed that the absorption of a neutron by a uranium nucleus sometimes caused that nucleus to split into approximately equal parts with the release of enormous quantities of energy, a process that soon began to be called nuclear 'fission'." The use of fission in this sense seems to date from about 1938 or 1939. In its biological sense, however, referring to the manner in which cells reproduce by splitting into two approximately

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equal parts, as does the nucleus, fission came into use about the middle of the Nineteenth Century.

Isotope is a word that was gradually creeping into the public's consciousness even before the announcement of the atomic bomb, for the tracing of metabolic processes by means of substances which can fool the body's chemistry but not the Geiger-Müller counters was vitalizing medicine and biochemistry prior to World War II. Isotopes have been called "the most useful mechanism in research since the invention of the microscope." But the tremendous installations for producing fissionable materials can also give off, either as by-products or by deliberate intent, comparatively huge amounts of radioactive and stable isotopes, and work is no longer restricted to small-scale studies of the most pressing problems. A recent story in the *New York Times* (without any attempt at a thorough survey, the author noted five news items in the *Times* relating to isotopes during December, 1947) mentioned that more than 100 stable isotopes of 29 elements are available for distribution to research laboratories in the United States. The word comes from the Greek words, *ισο*, meaning same, and *τοπος*, place; and this, as will be seen, describes an isotope accurately since all isotopes of the same element occupy the same position in the periodic table. There are uraniums¹⁶ with mass numbers of 234, 235, and 238; they are so difficult to separate from each other that it took an immense national effort to do it in quantity. There are five forms of zinc, with atomic weights of 64, 66, 67, 68, and 70, the average weight,¹⁷ that of zinc which is mined and used commercially, being 65.38. Similar situations exist for most of the other elements. That the existence of several varieties of the same element was the explanation for the uneven atomic numbers that so baffled the physicists was suspected by F. Soddy¹⁸ as early as 1910. "The same algebraic sum of the positive and negative charges in the nucleus when the arithmetic sum is different gives what I call 'isotopes,'" he said, "because they occupy the same place in the periodic table." Soddy's theory was at first received with a singular lack of enthusiasm, some of the implications of his theory being in Aston's words, "extremely repulsive to orthodox physicists." But in 1912 Thomson concluded that there were two types of neon, and by 1919 F. W. Aston's mass spectrograph had established final proof.

Through necessity, the great theorists and discoverers of science have been particularly fertile inventors of words. Obviously, if the theory or the fact is a step beyond current knowledge it is also a step beyond

(Continued on page 464)

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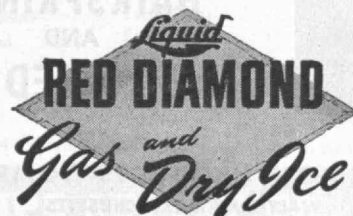
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THE SHADOWS OF SCIENCE

(Continued from page 463)

current vocabulary. For example, the neutron was discovered in 1932 as a by-product of research on some visitors from space that have also excited some public interest—cosmic rays. But the Oxford dictionary¹⁹ claims that the word neutron originated in 1921, and it is conservative. The term was first used by Rutherford in his Bakerian Lecture of 1920 to describe a particle, consisting of a proton and an electron in close combination (and therefore neutral in charge), which he felt might explain some of the phenomena within the atom.

Perhaps the outstanding case of an entire technical vocabulary being synthesized by one man (and with much of it going into public use, too) is that of Freud's psychoanalysis, a term he also coined. The words "id" and "libido" in their present connotations, as well as the terms "psychosis" and "Narcissus complex," stem from his writings. Freud noted two common effects in every male neurotic he examined: a strong love for the mother, and a complementary hatred for the father. Thoroughly versed in the classics, Freud was struck by the resemblance of this situation to one of the basic myths of antiquity—the legend of Oedipus. In the Greek version, Oedipus, who solved the riddle of the Sphinx, was fated to (unknowingly) kill his father and marry his mother. Discovering what he had done, he went mad. Today, no doubt, he would visit a psychoanalyst.

Because of its association with our strongest and most hidden emotions, Freud's subject matter, approach, and terminology have had an enormous effect on painting, literature, the stage, and the motion picture. A more than usually obvious instance is *Mourning Becomes Electra*, currently a movie, but earlier a successful drama by O'Neill. Somewhat soured by what he felt was a certain lack of finesse in wedding science to art, *Time's*²⁰ critic reported, "By attempting to dramatize the Oedipus complex in a framework of Greek drama, O'Neill produced a travesty of Freudian thought and something like a parody of Greek tragedy." But whether they be parodies or masterpieces, the works of O'Neill, Joyce, Proust, Mann, and many others are the bellwethers of a revolution that has occurred in the public's attitude toward the problems and the ills of the mind. Witness popular reaction to the Patton face-slapping incident and the public's probable approval of a similar act had it happened during the Civil War or Spanish-American War.

One could take up the sciences in turn—astronomy, biology, chemistry, and so on—noting the once special terms that are now generally used or understood, noting how and why they entered the layman's language. Then there would be the various fields of practical application, such as transportation or electronics. Trade names, such as Technicolor, Polaroid, Plexiglas, or Kodak form a subject in themselves. More important than the word, however, is the change in thought or habit that was created by or caused its absorption into the vocabulary. It is no coincidence that, as the key terms of genetics, anthropology, or atomic physics are finding their way into common usage, laws, morals, and mores are also changing. In the words of Lord Byron, "... words are things, and a small drop of ink . . . produces that which makes thousands, perhaps millions, think."

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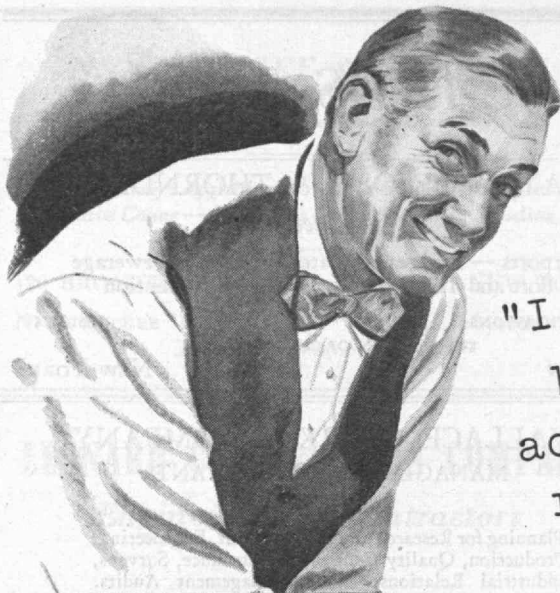
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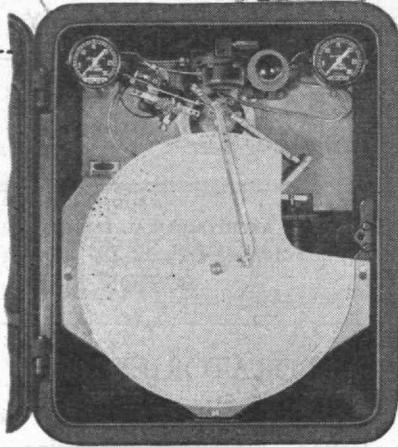
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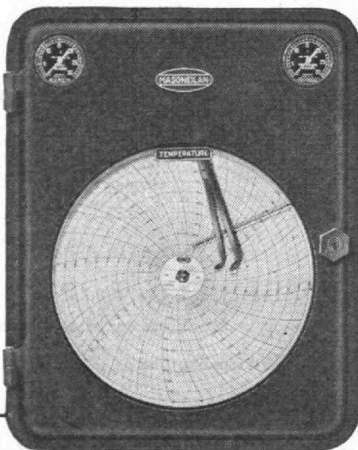


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TECHNOLOGY MEN IN ACTION

THE ALUMNI FUND — ITS PROBLEMS AND GROWTH

A Message

FROM THE

Fund Chairman

THE ALUMNI FUND BOARD wishes to express its gratitude to the nearly 10,000 Alumni who have recognized the great work of M.I.T. by contributing more than \$200,000 to the Fund during the year recently ended. This is the largest amount given since inception of the Fund in 1940 and represents a per capita gift of more than \$21.

Such recognition on the part of the Alumni affords proof of their vision, well expressed by Emerson over a hundred years ago when he said, "The true test of civilization is . . . the kind of man the country turns out." Our alma mater may feel that she is meeting the test today largely because of the personnel, equipment, and endowment made possible by the liberal contributions of Alumni in the past.

To you who have seen the great good that can come through a greater M.I.T. and have been generous in your response, I wish to say how grateful we all are. Your bountiful gift is equivalent to the interest on an endowment of at least five million dollars and will aid substantially in giving our school the things it so rightly deserves. May this record inspire all Alumni everywhere to make the Fund a channel for giving in the future — an investment which will bring greater happiness to all.

A. WARREN NORTON '21

Chairman, M.I.T. Alumni Fund Board

ALUMNI AND OFFICERS IN THE NEWS

Honors

For JEROME C. HUNSAKER '12, made an honorary commander of the civil division of the Most Excellent Order of the British Empire.

For RAY P. DINSMORE '14, to be presented, in London on June 25, with the Colwyn Gold Medal. This award by the Institute of the Rubber Industry is for conspicuous services of a scientific or technical character having an important bearing on the rubber industry.

For EDWARD L. BOWLES '22, made an honorary commander of the civil division of the Most Excellent Order of the British Empire.

For EDUARDO ICAZA A. '23, lately appointed a cabinet member of the Republic of Panama with the portfolio of minister of public works.

For HENRY B. GIBBONS '29, in April presented with the 1947 Wright Brothers Award of the Society of Automotive Engineers for a paper on his development of a novel type of wing construction for aircraft.

For NORMAN LEVINSON '33, ROBERT W. KENNEDY and PAUL A. SAMUELSON, staff, awarded fellowships by the Guggenheim Memorial Foundation.

For ERNEST E. LOCKHART '34, whose namesake is a mountain in Marie Byrd Land, in recognition of his membership in the Antarctic Service expedition in 1939-1941 and the Edsel Ford Mountains biological party in 1940.

For RICHARD C. FOWLER '37, one of 16 young men and women in the United States and Canada named in the first group of scholars in medical science appointed by the Markle Foundation of New York City.

Books

By ALFRED P. MORGAN '12, *Tools and How to Use Them for Woodworking and Metal Working*, illustrated with 600 drawings by the author, Crown Publishers, 1948.

By DAVID O. WOODBURY '21, *Battlefronts of Industry*, John Wiley and Sons, Inc., 1948.

By BENJAMIN F. MILLER '28, *You and Your Doctor*, McGraw-Hill Book Company, 1948.

By HERBERT H. UHLIC '32 as editor, *Corrosion Handbook*, sponsored by the Electrochemical Society, John Wiley and Sons, Inc., 1948.

By EDWARD W. KIMBARK '33, *Power System Stability*, Volume I: *Elements of Stability Calculations*, John Wiley and Sons, Inc., 1948.

By HENRY N. ANDREWS, JR., '34, *Ancient Plants, and the World They Lived In*, with drawings by Anna Schutte, Comstock Publishing Company, Inc., 1947.

By CLARK GOODMAN '40, as editor, *The Science and Engineering of Nuclear Power*, Volume I, Addison-Wesley Press, Inc., 1947. Individual chapters have been written by the following staff members: EDWIN R. GILLILAND '33, MARTIN DEUTSCH '37, JOHN W. IRVINE, JR., '39, CLARK GOODMAN '40, WILLIAM J. OZEROFF '42, CHARLES D. CORYELL, ROBLEY D. EVANS, BERNARD T. FELD, FRANCIS L. FRIEDMAN, and VICTOR F. WEISSKOPF.

By LAWRENCE B. ARGUIMBAU, staff, *Vacuum-Tube Circuits*, John Wiley and Sons, Inc., 1948.

By STANFORD GOLDMAN, staff, *Frequency Analysis, Modulation and Noise*, Radio Communication Series, McGraw-Hill Book Company, Inc., 1948.

By GEORGE R. HARRISON, staff, with C. G. Suits and Louis Jordan, as editors, *Applied Physics: Electronics, Optics, Metallurgy*, Science in World War II series, Atlantic-Little, Brown and Company. PRESIDENT COMPTON has written a foreword to the section on electronics. The book reports work done in certain divisions of the Office of Scientific Research and Development.

By THEODORE MORENO, staff, *Microwave Transmission Design Data*, Radio Communication Series, McGraw-Hill Book Company, Inc., 1948.

DEATHS

*Mentioned in class notes.

ALBERT J. DEANE '79, April 9.
CHARLES F. HOLDSHIP '84, date unknown.
WILLIAM L. PUFFER '84, March 8.
HENRY J. CONANT '87, February 14.
JOHN H. KEEP '87, May 29, 1947.
STEPHEN BOWEN '91, March 23.*
ANNA M. GOVE '91, January 28.*
GEORGE F. LOW '92, April 2.*
HORACE G. PRESTON '92, March 22.
ROY H. BEATTIE '93, February 21.
CLARA A. BLISS '93, February 1.
STEPHEN A. BREED '93, February 27.
JAMES P. BUCKLEY '93, October 2.
HAROLD M. MOTT-SMITH '93, March 28.
ARCHIBALD MURRAY '93, in July.
HARRY M. PHILLIPS '93, February 23.
HAROLD A. RICHMOND '93, April 8.
ARTHUR F. WOLTERS DORF '93, March 3.
DE NISE BURKHALTER '95, December 13, 1946.
JAMES H. WRIGHT '95, March 20.
MARK W. ALLEN '96, March 13.*
JULIUS F. GAYLER '96, February 21.*
DANIEL A. RICHARDSON '96, March 11.*
WALTER M. CABOT '97, in October.
CHARLES W. FRAZIER '97, February 19.

JOHN TEMPLE '97, March 13, 1942.*
J. WINTHROP TEWKSBURY '97, December 6, 1946.*

ANNA BARROWS '98, February 11.
JOSEPH J. MOEBES '98, date unknown.
EDWARD W. RITCHIE '98, July 29, 1946.
WALTER G. ZIMMERMAN '98, January 13.
HOWARD P. WISE '00, February 21.
EDITH M. HOBBS '01, December 21.
JOHN C. COBB, JR., '03, January 1.*
SAMUEL G. PORTER '03, November 30.
LEWIS B. MCBRIDE '04, October 7.
RALPH B. WILLIAMS '04, April 6.
PHILIP G. DARLING '05, February 16.
HERMAN A. HOLZ '05, March 19.
ZENAS C. STAPLES '05, in 1947.
RALPH E. TARBETT '05, January 23.
RALPH S. CLARKE '06, February 12.
HALSEY R. PHILBRICK '06, March 26.
JAMES J. MAHLER '07, February 8, 1947.
JOHN J. THOMAS '07, April 6.*
JOSEPH K. HEYDON '08, in September.
HARRY L. R. NICKERSON '08, March 25.
RUFUS W. G. WINT '08, February 27.
FRANCIS H. BISHOP '09, March 15.
WILBUR A. MEANOR '09, May 6.
VAHAN P. YACOUBYAN '10, November 19.
PETER D. WHITE '11, May 6.
ROBERT L. DEVINE '12, February 20.
JOSEPH E. HARRINGTON '12, April 30.
JOHN S. MARTIN '12, August 5.
JOHN E. WHITTLESEY '12, February 25.
ARTHUR E. BELLIS '13, March 27.*
JOSEPH J. STRACHAN '13, April 2.*
BERTRAND H. HALE '14, February 11.
WILLIAM L. HOLT '14, October 18, 1946.
JOHN H. STONE '14, March 17.*
NATHAN T. ASHKINS '15, August 26.
BRENDON P. LYONS '15, June 19, 1947.
SANFORD L. WILLIS '15, February 19.
JOHN N. MCDEVITT '16, February 24.*
BENJAMIN R. ROSENBERG '16, January 5.
CARLTON J. SPEAR '16, March 13.*
LAWRENCE C. COLBY '19, February 10.
W. SCOTT HAMMOND '19, February 7.
KANESABURO KUROKAWA '19, May 1.
DAVID B. LEPPER '22, December 8.
HAROLD I. BEADLE '23, May 8, 1947.
LEPINE H. RICE '23, April 15.
JAMES M. POOL '24, August 10.
KING O. WINDSOR '24, in February.
THOMAS L. GLEDHILL '26, July 19.*
GEORGE H. ROCKWOOD '26, April 23.
GEORGE W. D. WALLER, JR., '26, January 14, 1947.
PHILIP G. HOWLAND '34, in December.
DUANE DAVIS '35, November 22.
WARREN B. GODDARD '39, August 24.*
ROBERT A. FRANZ '41, February 25.*
JAMES A. THOMPSON '41, March 29.
JOSEPH VEDERMAN '41, date unknown.
HARRY D. CAMPBELL '47, February 16.*
WILLIAM L. PARISOLI '47, July 3.

NEWS FROM THE CLUBS AND CLASSES

CLUB NOTES

M.I.T. Club of Monterrey

It was a great pleasure for all the members of our Club to have with us for a brief visit H. E. Lobdell '17, Executive Vice-president of the Alumni Association. His trip to Mexico City provided for a short stop in Monterrey both coming and going, from February 26 to February 28 and from March 5 to March 7. On February 27, the Club gave a dinner to welcome him at the Casino de Monterrey, the leading club of the city. On this occasion, Mr. Lobdell reported to us on present developments at the Institute, the problems raised by the influx of veterans, and the large part played by our alma mater in the technological side of the war.

On his return from Mexico City, a luncheon was served in his honor at the Instituto Tecnológico de Monterrey, an educational institution which, on a small scale, is following in the footsteps of M.I.T. Technology Alumni are listed on its board of directors as well as among its faculty. Mr. Lobdell seemed well impressed with its organization and its modern buildings. He was also taken to visit several of our larger industries, which create the need for technical training here.

Present at the club dinner on February 27 were the following: Eliot Camarena '44, Juan Celada '44, Bernardo Elosúa '23, Eugenio Garza-Sada '14, Juan Garza Lafón '12, Alberto P. Ganzález '01, Enrique J. Muñoz '10, Ramon F. Muñoz '09, Camilo G. Sada '32, Francisco Sada, Jr., '17, Leonardo Siller '28, and Roger E. Valentine '23. — **BERNARDO ELOSÚA**, '23, Secretary, Ladrillera Monterrey, S.A., Apartado 360, Monterrey, N.L., Mexico.

M.I.T. Club of South Florida

The 11th anniversary of the founding of the Club was marked by a meeting held on February 14 at the San Regis Restaurant. The dinner was arranged in tables for four, each table being attractively decorated in keeping with St. Valentine's Day, with flowers and favors wrapped in red at each place. Mr. and Mrs. Al Taylor were in charge of arrangements. We enjoyed a fine chicken dinner, after which Thomas Coogan '24, President, spoke, bringing our attention to the Club's anniversary. C. P. Thayer '23 expressed appreciation to many individual members for their club activities and led a discussion on plans for future meetings.

B. Howard Brown '30 gave an interesting history of the Club from the time it was formed in 1937. The founders were Ray Burrus '22, Brown, and Thayer, and through the efforts of these men the Club grew, drawing membership from all South Florida; its first president was Ray Burrus, and C. P. Thayer has held the office of secretary since the Club was founded. Honored guests at meetings have included Karl T. Compton, President of the Institute; Horace S. Ford, Treasurer; E. H. Schell '12, in charge of the

Department of Business and Engineering Administration; W. C. Voss '32, in charge of the Department of Building and Engineering Construction; H. E. Lobdell '17, Executive Vice-president of the Alumni Association; and John H. Clouse, dean of engineering of the University of Miami.

The following members attended the anniversary meeting: Paul W. Comstock '39, Charles W. Swift '99, Clarence P. Thayer '23 and, accompanied by their wives, Meyer A. Baskin '34, B. Howard Brown '30, Thomas P. Coogan '24, Stanley P. Fosgate '24, J. Coleman Jones '23, James H. Klein '42, Morris N. Lipp '20, George J. McCaughan '34, John J. Ostlund '35, and Bernard Ross '37. — **CLARENCE P. THAYER** '23, Secretary, 4212 Northwest Sixth Avenue, Miami, Fla. **IRVING PESKOE** '39, Review Secretary, 2852 Southwest 22d Terrace, Miami 33, Fla.

M.I.T. Club of Central Pennsylvania

The annual meeting of the Club was held on April 20 at the Commissioned Officers Mess of the Mechanicsburg Naval Supply Depot. After an excellent steak dinner, we were welcomed to the depot by its commanding officer, Admiral John Ball. Our speaker, Captain R. K. James '33, officer in charge of the ships parts control center, discussed the problem of supplying repair parts to the entire Navy. This gigantic task is controlled from Mechanicsburg, which is the largest naval supply depot in the world. Captain James's talk was both interesting and enlightening, and the entire group now has a much clearer conception of the difficulties of providing our Navy with supply parts at its several stations all over the globe.

During the short business meeting, the following officers were elected: C. J. Walton '14, President; G. C. Wilson '15, Vice-president; J. P. Connelly '28, Vice-president; Harold Radcliffe '41, Secretary-Treasurer.

The Alumni present are listed below: E. A. Weimer, Sr., '98, F. A. Robbins, Jr., '02, R. E. Irwin '09, L. G. Rice '10, C. J. Walton '14, G. C. Wilson '15, E. J. Mink '22, S. I. Zack '22, B. J. Stevens '23, R. P. Rudolph '28, H. R. Spaans '30, R. K. James '33, P. N. Redday '35, J. W. Souser '40, Harold Radcliffe '41, R. E. Smith '41, G. W. Smith, Jr., '47, H. W. Welch '47. We were pleased to have the following guests attend our meeting: Admiral John Ball, A. P. Bixler, H. J. Bixler, F. McCauley, Jr. — **HAROLD RADCLIFFE** '41, Secretary, Irving College Apartments, Mechanicsburg, Pa.

M.I.T. Club of New York

On March 31, we had the privilege of hearing Professor Philip Morse, now director of the Brookhaven Laboratories, tell us in brief exactly what the objectives of the civilian development of the atomic energy project are. We were also fortunate enough to have Lester R. Groves '17, the lieutenant general, come in for an informal talk on the

military aspects of the subject. General Groves has now retired and is director of the research laboratories of Remington Rand and naturally chose a good town to live in, Darien. I played golf with him the other day, and I warn all of you choppers or hackers to be careful. The General is quite as deadly in his estimates of his score, strange course or otherwise, as he was at Hanford.

Some 200 men turned out to hear Dr. Morse and General Groves, and I think we all were most appreciative of the points developed by both speakers, although no doubt much enlightenment is still needed in the community and in industry. The meeting was also utilized for a brief business session, at which the members at large voted a ratification of the new by-laws and the change in name of the Club. Hank Hunter '16, who has figured for eight years in the deceased part of the Alumni Register, called me up recently, and he and I went out to lunch together to look over some possible new locations for a club in the Grand Central district. He is very much alive. Our investigations offered reasonable encouragement, but nothing definite. — **WILLIAM W. QUARLES** '24, Secretary, McGraw-Hill Publishing Company, 330 West 42d Street, New York 18, N.Y.

M.I.T. Club of Panama

A very enjoyable dinner meeting was held on April 9 at the Hotel Tivoli at Ancon in the Canal Zone. Twenty-one Alumni residing in the Republic of Panama and the Canal Zone were present. The meeting was held to honor Eduardo Icaza A. '23, who now is the minister of public works for the Republic of Panama. Meade Bolton '16, President of the Club, was toastmaster. It was decided to have the next meeting in Panama under the direction of those Alumni residing there. The guest of honor gave a fine talk on the necessity for clear thinking and use of a high order of intelligence in relations between Panama and the United States.

The following members were present: G. W. True '11, Meade Bolton '16, J. R. Hawkes '19, H. F. Finch '21, W. F. Christmas '23, Eduardo Icaza A. '23, I. F. McIlhenny '23, E. G. Bromilow '26, L. B. Moore '26, R. A. Saavedra '29, J. I. Barnett '30, M. P. Calderon '30, H. S. Brewer '32, C. W. Chase, Jr., '34, R. R. Brown '35, G. C. Dunlap '35, Alberto de St. Malo '35, E. I. Davis '37, F. J. Morales, Jr., '39, Marshall Waller '46, Isidro Fong '47. — **CONSTANT W. CHASE, JR.**, '34, Secretary, Box 77, Balboa Heights, Canal Zone.

M.I.T. Club of Philadelphia

It is with deep regret that we report the death in a plane crash of Warren Greene, son of Norman J. Greene '22. Warren, a student at Yale, was flying his plane in New England when the accident occurred.

P. C. Pien '48, was graduated from the Department of Naval Architecture and Marine Engineering in February and is now

working at the Sun Shipyard in Chester. In about one year, Mr. Pien expects to return to China with some practical knowledge of shipbuilding. In the meantime, he would like to meet other shipbuilders in this section. His present address is 319 West 7th Street, Chester, Pa.

You will be interested to know that the Philadelphia area now includes some 1,500 Tech men and that more than 300 of these men are active in the Club. The club files have been overhauled recently through the combined efforts of Professor Locke '96 in Cambridge and Bob Harbeck '28 in Philadelphia. Our sincere thanks go to these gentlemen for a difficult and tedious job well done. If anyone is aware of any discrepancies, omissions, or other faults with our mailing list, please send a postal card to your Secretary.

Some of the boys have been thinking about organizing a fishing trip, perhaps at the shore or down the bay. If this venture interests you sportsmen, get in touch with W. H. Peirce '46, 532 East Mermaid Lane, Chestnut Hill, Philadelphia 18.

It is with real pleasure that we welcome to Philadelphia the newcomers listed below. We hope to see them often at our meetings on the third Tuesday of October, January, and May. Herbert O. Albrecht '22, Edward Allman '33, Burton S. Angell '43, Frederick P. Baggerman '37, Robert E. Bates '38, Donald L. Blachly '46, Edward H. Bowman '47, Dayton T. Brown '21, Eliot H. Bryant '19, James B. Castner '27, Frank G. Cox '03, Walter Dietz '23, Donald A. Dunn '46, Albert E. Dupuy '28, Edward W. Eager, Jr., '25, Enright A. Ellis '31, William R. Evans, Jr., '46, Fred H. Flint '36, Theodore H. Gawain '44, Abe M. Gelbart '40, Theodore W. Gibson, Jr., '42, William B. Gist, Jr., '47, William D. Halfacre, Jr., '47, Edward S. Halfmann '36, Harry F. Hawkins, Jr., '42, Charles E. Herrstrom '24, Alan Hill '41, Joseph H. Hopkins, Jr., '45, Charles M. Hunter, Jr., '41, Robert K. Johnston '39, Ralph S. Jones '46, Fred D. Kierstead '37, John T. Lumis '46, Robert L. McMurtrie '45, Ira L. Meyer '36, John T. Moffett '26, George K. Nakashima '30, Tyson Nimick '24, Rufus W. Reckard '10, Robert E. Ritterhoff '46, Richard L. Saville '47, B. Paul Schmitt '44, Alfred C. Schroeder '37, Frank W. Smith, Jr., '44, Ralph E. Smith '26, Donald L. Thomsen, Jr., '47, Page S. Ufford, Jr., '44, David L. Van Syckle '33, and Harry L. Weinstein '26.

For further information about these or other Alumni in the vicinity of Philadelphia, call Boulevard 0287.—SAMUEL K. McCauley '41, Secretary, 288 Copley Road, Upper Darby, Pa. WILEY F. CORLE, JR., '39, Assistant Secretary, Box 358, Bryn Mawr, Pa.

M.I.T. Club of Western Pennsylvania

The April meeting of the Club was held on the 13th at the University Club in Pittsburgh. A group of 28 members and guests attended, including Alumni new to this section.

The evening opened with the usual excellent dinner, after which R. G. Lafean '19 introduced the business portion of the meeting with the mention of the sudden and

unexpected death on April 2 of J. J. Strachan '13. Joe Strachan had been a very active supporter of the Club and at the time of his death was serving in the capacity of vice-president. President Lafean announced that the next meeting, the last until early fall, would be held on May 18, when our guest would be Professor E. H. Schell '12 in charge of Course XV. A nominating committee made up of R. D. Hoak '28, chairman, C. T. Barker '27, J. L. Thistle '32, G. M. Hoffman '28, and Thomas Reed '40 was appointed to present a slate of new officers at the May 18th meeting. Charles M. Boardman '25, chairman of the scholarship committee, stated that Dean T. P. Pitre would be here on April 26 for the awarding of scholarships.

Herbert H. Hall '14 introduced our guest, W. W. Wentz, staff metallurgist for the Aluminum Company of America. Mr. Wentz presented an extremely interesting talk covering his visit to Japan during the late summer and fall of 1947. He accompanied his discussion with more than 100 beautiful color slides of pictures which he had taken during his trip. He also presented his personal observations of the industrial progress and rehabilitation of the people under our occupation forces. At the conclusion of his talk, Mr. Wentz graciously answered numerous questions.

Those attending the meeting were as follows: A. L. Klieves '01, H. H. Hall '14, H. L. Bone '17, R. G. Lafean '19, T. W. Bossert '20, E. L. Chappell '24, M. L. Tressel '24, C. M. Boardman '25, P. W. Robinson '26, G. M. Hoffman '28, A. A. Archibald '28, D. W. Dimock '28, R. D. Hoak '28, G. S. Hubbard '28, R. H. Shriver '29, C. H. Mohr '33, A. K. Redcay '34, W. J. Bates '35, G. C. Morrisette '35, Richard Muther '38, P. R. Toolin '39, F. J. Wilson '45, C. T. Barker '47, W. H. Brett '47, A. E. Winslow '47.—WILLIAM J. BATES '35, Secretary, 141 Woodhaven Drive, Pittsburgh 16, Pa.

M.I.T. Club of Rochester

Between the fields of the scientist and the engineer there is a hiatus, Dean George R. Harrison told the Club on February 18, which is being filled by a third group—the applied scientists. The Institute's Committee on Trends in Education has been studying some of these problems and has proposed the following definitions as a basis: Scientists are concerned with obtaining information and new facts regardless of their usefulness or economy. Applied scientists are concerned with achieving certain ends which must be useful, regardless of their economy. Engineers are concerned with achieving certain useful ends as efficiently and economically as possible. Solar energy offers an illustration. Scientists have measured, analyzed, and determined the properties of solar energy. Engineers are capable of utilizing it economically by producing alcohol from sugar, in turn produced by grains of plants which absorb solar energy directly. It is a problem for applied scientists, however, to study the thermoelectric utilization of energy and recently such fundamental studies of a useful but uneconomic phenomenon have increased the efficiency of a thermopile from less than 1 per cent to over 5 per cent. Such

a problem is distinct from the unbounded inquisitiveness of a pure scientist and yet not sufficiently well circumscribed for the engineer to take over.

Basic differences between these groups of technical men, Harrison said, are not nearly so great as might be indicated. The training of scientists during the war effort for highly technical engineering jobs was overemphasized, and in practice it was substantially as easy to teach engineering to scientists as it was to teach science to engineers! The choice depended upon which men were available and what was the most rapid way of getting the job done.

Four main groups of students are trained at Technology, the Committee on Trends in Education reports: (1) future engineers, (2) future scientists, (3) future architects, (4) future managers. Preliminary studies of the committee on how best to train these categories make it seem likely that the final report will recommend a little more differentiation between the academic curricula of these four schools.

At the present time, Harrison said, enrollment in the science departments has increased tremendously. In the Graduate School, physics has four times as many students as before the war; chemistry has three times as many. In the undergraduate school electrical engineering, aeronautical engineering, chemical engineering, and physics are all extremely overcrowded: one-fifth of the student body is enrolled in electrical engineering! A "retreading" program, Harrison said, is under way to try and direct student interest away from courses where the teaching facilities and the ultimate need for graduates limit the number of students, and into those courses where opportunities are greater. In particular, M.I.T. feels that electrical engineering and aeronautical engineering have been tremendously glamorized by the war and that neither the field of electronics nor of airplane design and construction can absorb anywhere near the number attracted to these courses. On the other hand, chemical engineering and physics, for example, are fields in which tremendous shortages of trained men will exist for a long time, and the Institute feels its obligation to train as many men as its facilities will possibly permit.

Research at the Institute, Harrison pointed out, was tremendously stimulated by the war effort and even now continues at manyfold the pre-war pace. The rapid progress of such research and the emergence of new fields of interest has created a great overlapping of research fields. Dividing lines between the branches of science and engineering must necessarily be kept for administrative purposes, but research knows no such barriers. Special laboratories have been set up to provide unified approaches to many problems. Each laboratory is staffed from the individual, interested departments, and its director is advised by a committee from these departments. These groups are purely structures for research. Four main centers have been established—nuclear science, electronics, acoustics, and spectroscopy. Highlighting some of the recent advances of these research groups, Harrison discussed a few of the plans and successful accomplishments of

each and when he finished was given a resounding vote of appreciation for a most interesting and lucid talk that had held spellbound even those who had expected to understand only snatches of his report.

The following club members were present at the meeting with Harrison: Harold E. Akerly '10, Collin H. Alexander '39, Sydney Alling '11, Joseph H. Altman '42, Alfred G. Bagg '37, Geoffrey Broughton '36, Alfred E. Castle '40, Henry R. Couch '20, C. King Crofton '22, Evan A. Edwards '37, Charles F. Fitter, Jr., '40, Arthur B. Fox '33, John R. Green '46, Kurt J. Heinicke '32, Albert S. Knight, Jr., '42, Frederick J. Kolb, Jr., '38, Andrew Langdon '22, Harold H. Leary '23, Emery M. Low '29, Lee McCanne '27, Leon L. McGrady '17, Kenneth J. Mackenzie '28, Charles F. Payne '33, Robert M. Phinney '04, David Richardson '37, Earl E. Richardson '19, Hugh McC. Shirey '22, Harold L. Smith, Jr., '39, Cyril J. Staud '24, Paul W. Stevens '37, Henry H. Tozier '96, Stanley C. Wells '30, Clarence L. A. Wynd '27. — **FREDERICK J. KOLB, JR.**, '38, Secretary, Building 14, Kodak Park, Rochester 4, N.Y.

M.I.T. Association of Japan

On February 19, a farewell party was held at Y. Mikimoto's ('38) for B. V. Hettich '43. His departure is regretted by all, particularly in view of his having taken such an active part in club activities and in helping Alumni here. We all wish him good luck.

On March 29, H. C. Kelly '36 left Tokyo for a month of temporary duty in Washington, D.C. He will be extremely pressed for time while there but may have an opportunity to visit the Institute. As deputy chief of the scientific and technical division of the Economic and Scientific Section, he has been devoting much effort to advising the Japanese on reorganization of the educational system, in addition to his many other duties.

Two more additions to our roster from among the occupational forces are: R. O. Burzynski '33, Captain, U.S.N., Commander, Naval Forces Far East, and Yu Ku Chang '29, Chinese Mission in Japan, Tokyo, Minato-ku, Azabu, Hiro-o-cho. — **MASARU KAMETANI** '25, Vice-president, 71 Shimizumachi, Suginamiku, Tokyo. **GEORGE YAMASHIRO** '42, Associate Secretary, Economic and Scientific Section, General Headquarters, Supreme Commander of Allied Powers, A.P.O. 500, San Francisco, Calif.

Worcester County Alumni Association of M.I.T.

A spring dinner meeting was held on April 13 at the Aurora Hotel in Worcester. Evidently we ran into conflicting dates, because our attendance hit almost a record low. Our guests for the evening were Professor Charles E. Locke '96 and H. E. Lobdell '17, our speaker, who gave us an up-to-date picture of activities and developments at the Institute. In addition, he answered numerous questions which called for answers from an expert of long-standing acquaintance with Institute affairs. We learned of projected plans for architectural dreams 50 years or more into the future, student loan business, bad boys and good, and innumerable other topics which could never be covered by any-

one else. Perhaps the coziness of the group induced the success of the discussion.

Members attending were the following: H. M. Latham '93, S. P. Newton '06, Jacob Ginsburg '15, E. P. Whitehead '20, Philip Loew '26, A. E. Jorjorian '31, F. M. Johnson '33, W. F. Baxter '34, R. G. Clarke '35, A. J. Larivière '35, R. A. Krey '36, D. M. Whitehead '45, D. E. Burke '46. — **ROBERT G. CLARKE** '35, Secretary, 17 Park Villa Avenue, Worcester 6, Mass.

CLASS NOTES

1888

Ellison C. Means writes from his home in Ashland, Ky., on the Ohio River that his house is 15 feet above flood level; hence he has had no trouble from the high water. He also says he has had a recent visit from his great-grandson from California, Robert Means Phelps, who is four years old. He spent last winter in Lakeland, Fla.

Sanford E. Thompson was recently notified of his election as an honorary member of the Boston Society of Civil Engineers. Other recent recipients of this honor are Edwin S. Webster, our President, and Emeritus Professor Dugald C. Jackson of Jackson and Moreland.

Your Secretary is beginning his season at Chebeague Island, where two acres have been added to the farm and the trees cut down to give a clear view of Cousins Island, two miles away toward Portland. — **BERT RAND R. T. COLLINS**, Secretary, Chebeague Island, Maine. **SANFORD E. THOMPSON**, Assistant Secretary, The Thompson and Lichtner Company, Inc., Park Square Building, Boston 16, Mass.

1891

Our old friend and classmate, Stephen Bowen, died on March 23 at Winter Park, Fla., in his 78th year. He had not been in good health for several years. Steve was born in Roxbury, Mass., and was a member of the Class of 1888 at Roxbury Latin School. He was initiated to the Phi Beta Epsilon Fraternity soon after it was founded and later served as president and treasurer of the Fraternity Corporation. After graduation he worked for the Otis Elevator Company until its plant was moved from Boston. Then, for a number of years, he was president of the Saxony Knitting Mills in Needham, Mass. After his retirement some years ago, most of his time was occupied as trustee of various estates and institutions. He was treasurer and a trustee of the Fernald School, an endowed state institution.

He was a member of the University Club of New York, the Algonquin Club of Boston, and, until recently, the Eastern Yacht Club of Marblehead and the Duxbury Yacht Club and was secretary of the Boston Riding Club. He is survived by a daughter, Anne (Mrs. Atherton Loring, Jr.), and three grandchildren, Atherton Loring, 2d (at Harvard), Emily Loring (at school in Baltimore), and Stephen Loring (at Exeter). For many years he had lived at 319 Beacon Street, Boston.

Steve loved to travel and spent many summers in Europe and most of his winters

in the West Indies and Florida. Some of these trips were made with his close friends, Harry Young and the late George Vaillant. Born in the "good old days" of horses, Steve began to ride at an early age and kept it up until the Riding Club closed a few years ago. He was fond of yachting, and his early days were spent in Newport and later ones at Marblehead; just a few years ago, he had built according to his ideas a new yawl, which he kept at Duxbury, where his daughter has a summer home. Steve was always good company and a kindly gentleman. We who knew him are going to miss him.

Our classmate, Dixie Lee Bryant, who lives in Asheville, N.C., gives us further information regarding Dr. Anna Gove, whose death was mentioned in our last class notes. She writes as follows: "I am still an alumna of Technology and am interested in the reports and letters in your column. Since I retired, I have made my home in Asheville, N.C., and find the climate delightful the year round. In 1892, I began teaching in the newly founded Woman's College of the University of North Carolina in Greensboro, N.C., and remained there for 10 years. After getting a doctorate in Germany, I taught in the Chicago high schools until my retirement in 1931.

"I believe it devolved upon me to report the death of Dr. Anna M. Gove on January 28 at her home in Greensboro, N.C. She was born in Whitefield, N.H. Her father, a doctor, planned a two-year premedical course, and she entered Technology in October, 1887, with our Class. She took her medical work at the Women's Medical College of the New York Infirmary and was graduated in 1892. In October, 1893, she came to the Woman's College of the University of North Carolina, Greensboro, N.C., as resident physician and has been connected with the college ever since, lately in the ranks of the faculty emeritus. A leave of absence in 1913 was for study in Vienna, another in 1917 was for medical work for refugees in France. The large and modern infirmary was of her planning. She made a 15-to-20-year record of examinations of young women for tuberculosis and read a paper on that work at the medical convention in New Orleans in 1936. The notices of her death told of her having been one of the three women who first took the state examinations and practiced in North Carolina. It voiced the gratitude and devotion of the many women who had had her care and friendship all these years."

We have had some brief letters from Bert Kimball in Redondo Beach, Calif., which indicate that he is in good health. He speaks of the dry weather last winter and the early spring as compared to our severe weather in New England. He expresses the hope that we will have a good attendance at our class dinner (to be held on April 30th) and sends his best regards to all. — A letter from Walter Hopton gives further information regarding the death of his wife. They celebrated their golden anniversary last year. Walter says he goes to business five days a week. His son and family drive up frequently from New Jersey. He sends his best regards to all his classmates. — **HENRY A. FISKE**, Secretary, Grinnell Company, Inc., 260 West Exchange Street, Providence, R.I.

1892

The Secretary recently received notice of the death of George F. Low at his home on Chestnut Street, Peabody, on April 2 in his 80th year. Low entered Technology with our Class in 1888 and was with us for a year or two. His entire career was spent in the banking business in Boston until he retired some 15 years ago. He was the second oldest past master of Jordan Masonic Lodge and one of the oldest members of the Unitarian Church in Peabody, of which he was treasurer at the time of his death, and was past president of the Unitarian Layman's League. He was a member of the Peabody Historical Society, in which he took an active interest. He leaves his widow, Grace M. Low; a daughter, Mrs. Winslow M. Kingman of Arlington; and a sister, Annie T. Low.

H. C. Dresser called at my office at the Institute the other day with the report that he was well and active. I regret being absent at the time and hope to get in contact with him later. I am going to try to persuade Channing Wells to take over as class agent on the Alumni Fund now that the drive is on for the coming year. Ralph Sweetser was obliged to resign on account of his health last fall after serving many years in this capacity with great efficiency. Our best wishes go out to him with hopes for his full recovery. — CHARLES E. FULLER, Secretary, Box 144, Wellesley 81, Mass.

1894

The Secretary's projected tour, mentioned in the class notes in the March issue, became a reality following his re-election as chairman of the board of governors of the Refrigeration Research Foundation at its Atlantic City meeting in early February. This foundation sponsors and aids in the support of research projects in various aspects of refrigeration and especially those relating to food conservation. To a great extent, the investigations are carried on in widely scattered educational institutions, and it was for the purpose of visiting a few of these and holding conferences with the investigators, as well as having a conference with the research director, that this long journey was undertaken. The projects visited were at the Georgia Experiment Station, at Experiment, not far from Atlanta, where the refrigeration of the lowly peanut—a two-billion-pound crop, by the way—is being studied, then at Louisiana State University, where the refrigeration of shrimp is our interest, and then at the University of Texas, where a study of specific heats of various foods is being made.

Being in Atlanta gave the opportunity to visit Harry Bates for a long half day. As fellow Course V men, we had much to talk over, both in reminiscence and in the discussion of our own personal affairs, past and present. Meeting for lunch at the Atlanta Athletic Club, we began our stories of our doings. Bates has spent practically all his professional life in the agricultural chemical industry, and for many years previous to his theoretical retirement on January 1, 1946, he was manager of the manufacturing department of the International Agricultural Corporation and since then has been a general consultant to the company. His work

has taken him to many parts of the country, building and enlarging plants, organizing manufacturing operations, and developing new products, including not only fertilizers but many other kinds of chemical products. He has probably built and controlled the operation of more fertilizer chemical plants, from Maine to the Gulf and the Mississippi, than any other man in his field. Although nominally retired more than two years ago, he actually was still on the job, and some of the largest and most complicated plants of the corporation were constructed and put into operation by him after his retiring date. He seems to have been indispensable. It is good to report that the years have dealt kindly with him and he is in excellent health, alert and active, and interested in affairs and in music as of old, although he says he has ceased to sing semiprofessionally in public or in church choirs, as he did for many years. He is still one of the mainstays of the Atlanta Alumni Association of the M.I.T.

After our luncheon, Bates took me for a long drive, including a hasty visit to the grounds and buildings of the Georgia School of Technology. After a stop at his charming home at 1700 North Pelham Road, Northeast, and a delightful little visit with Mrs. Bates, we went to the attractive and extensive campus of Emory University with its notable buildings and its new and magnificent hospital, then past Agnes Scott College, one of the top-grade colleges for women, of which Bates's daughter is a graduate—in chemistry of course! She is now the wife of one of the executives of General Electric, and her son may soon be seeking admission to M.I.T. After we had dined together at the Athletic Club, Bates took me to the railroad station for my train to New Orleans, and we parted with regret, having re-remembered the friendship of much more than a half century.

Arriving at New Orleans early in the morning, I was met at the station by Professor Pieger and immediately started on the pleasant 80-mile trip to Baton Rouge and Louisiana State University. Here the larger part of two days was spent in reviewing research progress; but there was opportunity also to glimpse this rapidly growing city and the university with its 12,000 students and a very vigorous spirit of research and advancement in education. We may think of this great school with memories of Huey Long and high-power football teams, but it now gives an impression of quality as well as size and is a center of much scientific work of general as well as regional interest. Baton Rouge itself, because of the influx of great industries, oil and others, has changed from a quiet capital to an increasingly important industrial city. On our return to New Orleans, the time before my train sufficed for my host to point out some of the substantial and steady growth which is transforming New Orleans into a great modern city. Still intact are many of the old buildings and a considerable section of the old French quarter, which years ago made New Orleans possibly the most interesting city in the United States. It is still a place of appeal to the traveler with an interest in history, as well as the metropolis of southern states, a claim which will no doubt be made by Houston, which is showing miraculous

growth both in wealth and in population.

Arriving in San Antonio, the business section of which presents a clean, substantial, and prosperous appearance, I went to Austin for my next conference. The University of Texas, sixth in endowment in the country, is crowded by its 18,000 students. Here, as at L.S.U., M.I.T. men are to be found on the staff but no '94 men in the city. This university is doing excellent work in science and engineering. Our project here is gradually yielding results which will be of much significance to the refrigeration industry.

From Austin and San Antonio, the Secretary made the long haul to southern California and spent 10 days in and around Los Angeles, visiting friends, former students, and relatives and having a most enjoyable time. But again, no classmates were seen, although Arthur Farnsworth practices patent law, and W. L. Woollett has an architect's office in Los Angeles, and several others are located in the cities and towns within 100 miles. Unfortunately, attempts to reach them by telephone were fruitless. Meetings with old students and men of other classes are pleasant but do not fall within the scope of class notes. A day was spent at the Price ranch, where Mrs. Price was, as always, a delightful hostess. Incidentally, she is spending the summer in France, where she and Ray lived for so many happy years. Moving on to the Bay district, the Secretary again was a supper guest of the Austin Sperrys at their delightful home in Berkeley, and again Austin arranged for the '94 reunion of the three of us, Sperry, Nowell, and Prescott, at the Bohemian Club. This seems to have become an annual affair, as it has now happened for three successive years, and always with the maximum of enjoyment. Both Sperry and Nowell were "in the pink" of health. Sperry has an office in San Francisco where he would welcome any '94 man. His son is with one of the big construction or shipbuilding companies, and one of his daughters is married to one of the physicists at the great cyclotron at the University of California. Both Austin and Mrs. Sperry spoke with pleasant memories of the past and hopefulness that we might have a 55th reunion next year. They reported that T. Clive Davies and a daughter had visited them recently while Clive was on one of his periodic trips from England to Honolulu, and that, despite the severities of life in England during the past few years, Clive was in excellent health and filled with courage. Few of us can probably realize the adjustments his family has had to make during and since the war. We wish Davies would come to Boston and M.I.T. on some of his globe-circling business trips. There are still '94 men and others who would welcome him heartily. Jack Nowell lives in a beautiful spot on the edge of San Mateo. He is a good example of the retired man who keeps busy and well by taking an interest in all kinds of useful public service. As the Nowells have two married daughters in or near Boston, they come East frequently, and we shall hope to see them this summer. Since the Refrigeration Research Foundation has its main office in Berkeley, this was the expected center for conference with the research director, but our meeting was perforce actually

"Come Back to Tech . . ."

brought about in Portland, Ore., instead. This gave opportunity to go to Seattle to see friends and to Yakima, where I spoke at a luncheon of the Yakima Valley Traffic Association. After a return to Portland for a meeting of refrigeration men, the director and I came East, and I reached home three days before the advent of my first granddaughter.

A few other items have come to hand. A letter from Francis C. Green reported that he was recovering from a long and severe illness, which for months completely incapacitated him. He had previously been in some government position in Washington, where he now lives, but he hopes to make a change soon. John Ferguson sends in his address as 819½ Northeast 89th Street, Miami 38, Fla. John seems to be a permanent, rather than merely a winter, resident. Jim Kimberly is back at his summer home in Neenah, Wis. Dr. Oscar R. Couch has been heard from through the Alumni Office, and his address is Route 2, Harlingen, Texas. Professor Emeritus George B. Haven has sent in his address as Box 342, Laconia, N.H. John Kittredge is apparently still on the job in Hartford and lives at 352 Laurel Street, Hartford 5, Conn.

Charles Abbot keeps as busy as before he retired as secretary of the Smithsonian Institution in Washington. Four papers of which he was author or joint author have come to my desk within three weeks. One of these deals with his studies and predictions on the cycle of precipitation at Washington, and the data seem to show that his theory is good and his predictions fairly reliable. He carries on his scientific work as a research associate at the Smithsonian, but he has other activities, including the very praiseworthy one of giving assistance in the training of a very promising and accomplished young singer, whose quality is so fine that critics predict an international reputation. It may not have been mentioned in class notes that in September, 1946, Abbot published a book, *The Earth and the Stars*, that sold a thousand copies in the first three months—almost a best seller. Heartiest congratulations, Charles.

Do you fellows realize that next year we shall have been "out" 55 years? Shouldn't we have another reunion? The Secretary thinks so and would earnestly request comment and suggestion from all who read these notes. If the opinion is favorable, some of us here will be glad to begin plans. A large and prompt response is requested. —SAMUEL C. PRESCOTT, Secretary, Room 3-233, M.I.T., Cambridge 39, Mass.

1896

Rockwell recently attended the 30th annual gathering of the members of Base Hospital 44 of World War I. He was medical chief of that unit in France, and their first meeting took place in France. This 30th anniversary was a special event, and degrees were awarded by Dr. Lee. Rockwell was the recipient of an illuminated plaque with the following citation: "DR. JOHN A. ROCKWELL. Faithful comrade through all the vicissitudes of our organization; always vitally interested in the welfare of our members; efficient helper in the activities of our Veterans Association; a true gentleman whose sterling

qualities of character and kindly spirit have endeared him to us all; an exemplar of sustained and unselfish devotion. MASTER OF DEVOTION." Marsh Leighton has written a characteristic letter to Rockwell telling in his own inimitable way how he seems to have a hazy memory of an athlete in our Class who bore the name of Rockwell, and how therefore it seems most fitting that the new field house at M.I.T. should be named the John A. Rockwell Field House.

Henry Waterman has sent the Secretary a copy of the *Halifax Chronicle* of March 11 dealing especially with the unveiling that day of a plaque in the historic assembly hall of the Province House on the opening day of the legislature to commemorate the 100th anniversary of the establishment of the first responsible legislature in the British Empire overseas. Henry was elected a member of the Nova Scotia Legislature in 1940.

The last word from Jim Melliush is to the effect that he is recovering very slowly at the Harbissette Manor convalescents' home in Albany from what his doctor said was pneumonia, and it was his expectation that before long he would be back at his residence and on his job again. Our classmate George S. Bowes, for whom we have had no address for a long time, has been relocated. During the summer months he is at 39 Foster Avenue, Chautauqua, N.Y.; during the winter months he can be reached in care of Beatrice Skinner, Portland, N.Y. Our classmate H. C. Lythgoe, now retired from his former job of food and drug director of the Massachusetts department of public health, was honored at the Chicago meeting of the American Chemical Society on April 19 as one of the group of members of 50 years' standing. Another man in this group who is well known to many of the members of the Class is A. G. Woodman '97, who attended some of our classes in our student days.

George S. Hewins has changed from his old residence and is now at 9 Upwey Road in Wellesley Hills. Myron Fuller has reported that Fort Myers was warmer than usual this past winter, and that he was planning to mark his 75th birthday by an 8,000-mile automobile trip to California, leaving Florida about May 1 and arriving in Easton, Mass., sometime in June. His principal objectives were to be the natural bridges of the Utah deserts, the stone faces of the presidents at Mount Rushmore, South Dakota, as well as the bad lands of the same state, all of which he had somehow missed on previous trips.

Wayne, in the Methodist Hospital in Indianapolis, has convalesced to the point where he was able to write the Secretary a long, newsy letter giving the complete story, beginning with the premedical stage, his call on the doctor, and his hospitalization. At the time he wrote he had reached the point where he was ambulating successfully around the corridors. He was apparently receiving every attention from the nurses, the Alumni in Indianapolis, and his former telephone associates, and was looking forward to being discharged in the not-too-distant future.

Reg Norris, from whom no word has arrived since before the war, has written that he is now at 38 Avenue de Candia, Nice, Alpes-Maritimes, France. This is a home for old people, where his mother-in-law is

general housekeeper, his wife is secretary, and he is doing bookkeeping. He is planning to come back to the United States at the first opportunity, and by sale of a valuable painting he has funds to pay for transportation to California, where there are relatives. His income in France has naturally ceased, and what he had in the way of property and funds in the United States was stolen. Before the war he was considered younger than his age, but now he has aged and become very much weakened by lack of proper food. He is appealing for a few food packages and mentions specifically butter, milk, either condensed or powdered, fat bacon, and sugar as being among their greatest needs. He also has the problem of getting someone to supply an affidavit that his wife, who is not an American citizen, will not become a public charge in the United States. It does seem rather sad that the war has brought our classmate into such dire straits.

Julius F. Gayler passed away on February 21 in a hospital in Poughkeepsie, N.Y., at the age of 75. He was with us two years, from 1892 to 1894, as a student in Architecture. He was born in Pittsburgh on October 21, 1872, but was brought up in St. Louis. He practiced the profession of architecture for years in New York, first as a member of the firm of Carrere and Hastings, and later independently. He had designed many large country homes, including those of the late E. H. Harriman at Arden, N.Y., the late Grenville Winthrop at Lenox, Mass., and the late Hamilton Fish Kean of Elizabeth, N.J., the United States Senator. He was an experienced etcher and had lectured on the technique of aquatints. He had retired a few years ago.

The Class has suffered a great loss in the passing of Mark Allen on March 13. He had not been in the best of health for some time but had continued active in his business in Detroit. We looked upon him as one of the most loyal members of the Class. He had taken part in various organizations as a student and also in many civic and community affairs in Detroit, where he successfully carried on the business affairs inherited from his father. He is survived by his widow, his daughter, Mrs. John W. Hession, Jr., and a son Richard, whom some of us will remember as having come with Mark to one of our five-year reunions. We missed Mark at our 50th anniversary reunion. He had counted on coming, but business affairs prevented it at the last minute. He was a man whose company was most enjoyable, and he in turn seemed to derive great pleasure by meeting the fellows at our reunions. He is a classmate who will be greatly missed.

Daniel A. Richardson passed away in Sarasota, Fla., on March 11, after an illness of two days. He had been maintaining a residence at 28 Jefferson Street, South Braintree, but during the winter he operated the Sarasota Trailer Park at Sarasota, Fla., and during the summer he ran the Holiday Bungalows at Laconia, N.H. Although he was a life member of the Alumni Association and the Secretary had occasional correspondence with him, he never had apparently taken any live interest in class affairs and had never appeared at any of our class gatherings. His widow survives him. —CHARLES E. LOCKE, Secretary, Room 8-109, M.I.T., Cambridge

39, Mass. JOHN A. ROCKWELL, Assistant Secretary, 24 Garden Street, Cambridge 38, Mass.

1897

In reply to an 11th hour appeal to Jere Daniell for a letter describing the trip that he and his wife made to Europe last year, we received the following, which we are sure will be greatly enjoyed by his classmates: "Yes, we did arrive safely home, and we were converted neither to Communism, to Fascism nor to British Socialism. Also, we did not spend the winter in Europe but put in most of it at our farm home in Franklin, N.H., including that grand month of January.

"As for our trip, we sailed from Montreal on July 26 in the *Empress of Canada* and had a glorious ocean voyage to Liverpool with magnificent ship service. We cannot say too much for the good old Canadian Pacific management. From Liverpool we went north to Glasgow, where I hunted up an old colleague of mine in the shipbuilding trade who was with me in Cartagena, Spain. From there we crossed over to Edinburgh, visiting the Scotch Highlands by motor-bus, and then journeyed down to London by train, stopping off in York and Lincoln to see the cathedrals. After 10 days in London, we visited old friends on the South Coast near and in the 'New Forest' region, having a grand time and enjoying every moment. Here in the intimate family life we could understand how close the rationing really is. Never a really full meal as we understand it. Cabbage, potatoes, and summer squash were the only vegetables, the sausage was a nearly 50 per-cent bread mixture; very little bacon was to be had. We had food packages from the United States sent to our friends, and how they did enjoy them! From the coast we returned to London for a few days, then went by train and channel boat to Paris, where we blew ourselves to a week at a swanky hotel. At last year's exchange of 89 francs to the dollar, we could buy nothing. Pajamas of cotton sold at \$45 a set, for example. Now, at 300 francs to the dollar, one can travel and buy in reason. We visited Paris a year too soon.

"From Paris we went by train to Madrid, where we spent 10 days, stopping on the way at San Sebastian and Bilbao. We had a grand time in Spain. Our old friends killed the fatted calf for us many times over, to put it mildly. Spain we found to be a traveler's paradise with no restrictions, prices reasonable, and rooms available at most hotels at fair prices. The railroad equipment is rather antiquated and in poor condition, and it is often hard to get seats in the good trains; but these are the only drawbacks. Madrid seemed to us the world's cleanest city. You never saw such continual washing down. Boston is a filthy mess in comparison. The great art museum of *El Prado* is more magnificent than ever. It suffered practically no losses during the years of civil war and has recently been redecorated and rearranged and is in wonderful shape. One could spend every day for a month there and enjoy every moment. Few scars of the civil war remained. Only one building of the University City has not been rebuilt. A tremendous amount of new building was under way around the city. The people in

general gave every appearance of content and well-being. We found little evidence of poverty anywhere. Enormous crowds attended football games and bullfights, and of course we saw a bullfight, and a good one. We saw one matador kill six bulls in one fight, a very unusual feat. Altogether, we decided that Spain was the best country in Europe to visit under present conditions. We did not go into Switzerland or Sweden.

"Returning to London from Madrid by plane, we had a fine flight on a calm sunny day, spending about five hours in the air. Because of a crowded schedule, we had to leave Madrid five days earlier than we wished and pass about 10 days more in London than we had expected. At that time an unusually cold spell had set in with below-freezing temperatures at night and no heat in any hotel, and did we shiver! We sailed from Liverpool in the *Empress* again and had a rather rough, cold passage back to Montreal. But we considered it altogether a fine trip.

"Yes, we were well snowed in during January. We never have installed central heating in the old farm home and therefore concentrated; shutting off half the house and living in the old farm kitchen and dining room, we stuffed the stoves with good red-oak firewood cut on the place and were snug and comfortable. A near-by resident with a jeep plow kept our drive plowed out; otherwise we should have had to use snowshoes."

Elizabeth N. Bancroft, wife of Wilfred Bancroft, passed away on March 24 at the family home at 761 Millbrook Lane, Haverford. Besides her husband, she leaves one daughter and two sons. — We have but recently been advised of the death of John Temple, II, on March 13, 1942, and of J. Winthrop Tewksbury, IX, on December 6, 1946. No other details are known at this writing. — JOHN A. COLLINS, JR., Secretary, 20 Quincy Street, Lawrence, Mass.

1898

The blessed showers for class notes continue, though not in such torrential quantity as last month. We acknowledge receipt of letters from George Anthony, Milan Ayers, Ernest Bragg, Dan Edgerly, Charles Pendell, Charlie Winslow, and — mark this — a letter, written to Lester with information, from our good friend, Proctor Dougherty '97. To all the above we extend hearty and manifold thanks.

We are impounding these precious floods and will let them out only very sparingly in the class notes, for many reasons — first, self-protection. You'd be surprised how quickly the reservoir will empty, unless it is fed continuously by the thoughtful sons and daughters of '98. Another reason is that we are looking forward to the Golden Anniversary, and our minds are now centered on that. Three-quarters of the '98 readers of *The Review* are planning to come to the reunion; and others, at last reports, are still considering. By the time these words reach your home, it will be June, the anniversary month, and many will be about to start or may indeed have already left home and be en route. Thus, we understand that Howard and Mrs. Bodwell plan to leave La Jolla, Calif., about May 1 and drive across country to the Golden. It is our opinion that the

impounded copy would be more appreciated after the reunion, when you are all back home, and we ask those who may not be coming to the reunion to have patience, and everything will be forthcoming in due course.

Finally, we must avoid any possibility of mixed signals for the Golden. It will not do for the notes to say one thing and Lester another. There is a considerable time lag, as above suggested, between the date on which these notes are written and that when they are received. Although we have been working closely with Lester, trying to keep up with him ("Some stunt," I hear those of you saying that know Lester well), and although Lester was in Boston early in April to make final arrangements, there might be something unintentionally wrong in the notes — and then again Lester may at the last moment have to make a shift of plans. This would lead to confusion. Accordingly, for the reunion, *Lester is the authority* — he calls the signals, and no one else.

In this connection, we remember that the late and highly esteemed Professor Arlo Bates used to remark to his classes in composition, "A book worth reading is worth rereading, and a book worth rereading is worth rereading." Read, reread, and re-reread Lester's letters. They give the full story in terse and original style. Have you made all your reservations? Lester and the committees are not mind readers, and if the hotel is booked solid — or the Pops or any of the other festivities — it will not help much to say, "I forgot" or "I didn't notice that." Of course, it will not be so bad as this, but do take time to re-reread Lester's letters, especially "Information please" and make everything sure. If at the last minute some of you who are now undecided find that you can come to the Golden, there will probably be time to care for this. Lester will be in Boston at the Parker House from the first week in June with helpers to meet any and all emergencies.

All roads lead to the Golden Anniversary! — EDWARD S. CHAPIN, Secretary, 463 Commercial Street, Boston 13, Mass.

1899

Walter R. Bean, XIII, after spending his entire professional life in the shipbuilding industry, retired in June, 1946. After graduation, he went to Newport News as a tracer, until in the following year, he entered the employ of the New York Shipbuilding Corporation at Camden, N.J., as draftsman. He remained in that capacity until 1919, when he was made chief mill draftsman. In 1931, he was appointed hull drafting supervisor at the Fore River works of the Bethlehem Shipbuilding Company in Quincy, Mass., where he remained until his retirement in 1946. Although Walter does not go into detail, presumably he must have had much to do with plans for warships in both world wars, I and II. He is living at 8 Capen Road, Braintree, Mass. He reports that both his sons are taller than he. Since he is six feet plus and weighs 150 pounds and they are respectively 30 and 50 pounds heavier, it looks as though he had better not let them gang up on him.

George P. Dike, II, won his A.B. from Williams College before coming to M.I.T.

"Come Back to Tech . . ."

and an LL.B from Harvard three years after receiving his engineering degree. Thus fortified, he became a member of the law firm of Macleod, Calver, Copeland, and Dike in Boston. Subsequently, he became the senior member of the firm with offices in the Tremont Building. During World War I, Dike was a member of a special commission to advise the Secretaries of the Army and the Navy on royalties on airplanes used by the government. He is on the board of managers and is now first vice-president of the American Patent Law Association; a member of the patent section of the American Bar Association and the patent committee of the Boston Bar Association; director and former president of the Boston Patent Law Association; and a member of the executive committee of the International Association for the Protection of Industrial Property. Since his hobby is growing hardy chrysanthemums, he belongs to the National Chrysanthemum Society and the Chestnut Hill Garden Club and was active in the Victory Garden committee of the Town of Brookline during World War II. Further to keep himself busy, he was a member of the Brookline Town Meeting and is now on two visiting committees at the Institute. In his leisure time he plays golf.

At the annual Alumni Day on June 12, a committee will be formed to make arrangements for the 50th reunion of the Class of '99. You should plan to be present. — BURT R. RICKARDS, Secretary, 381 State Street, Albany, N.Y. ARTHUR H. BROWN, Assistant Secretary, 53 State Street, Boston 9, Mass.

1900

The only class news that your Secretary, still traveling in Florida, received this month was from Tom Perry, who wrote as follows: "Just to show you my sympathy with your problem of extracting information from indolent classmates, I am giving you a bit of Perry news. I was retired by the Resinous Products and Chemical Company last July, after 11 years of service, to what was supposed and reputed to be a life of well-earned leisure, but my time proved to be more fully occupied than ever. What with writing for trade magazines, revising my book, *Modern Plywood*, editing the woodworking section of the forthcoming edition of Kent's *Mechanical Engineers' Handbook*, serving as consultant, giving college lectures and expert court testimony, I am finding almost no time for my hobby of stamp collecting, which was intended to keep me out of mischief in my declining years. Hence, I have enough to do to prevent my being too frequently drafted into household duties.

"Fortunately, Mrs. Perry and I are in excellent health and have been pushed into a five-room apartment that has a large, dry basement for my various indoor activities and a good-sized garden plot where I can play with my 200 evergreen trees. Maybe this fascination with evergreen trees has something to do with my engineering in woodwork. We are most interested in our six grandsons, all under six years, two apiece for each of our three children—not too poor a record for an oldish couple and a fairly good guaranty that the name of Perry will live on through the years. They live near New York, Boston, and Portland, Maine,

where we can see them from time to time, and are such a lively crew that if we should ever get them all together, we might be apprehensive about bringing on a first-class rumpus." Tom also mentioned that he was speaking at M.I.T. under Professor A. G. H. Dietz '32, but unfortunately, I could not be there as I was then on my way home. I wish we could receive many more letters like Tom's from others of the Class.

The Alumni Register has received a change of address for George Gibbs, from Caribou, Maine, to 2514 Thorndale Avenue, Chicago 45, Ill. — ELBERT G. ALLEN, Secretary, 54 Bonad Road, West Newton 65, Mass.

1901

A memorandum for The Review from Professor Locke '96 states that D. F. Haley has been made chairman of the subcommittee on technology on the National Minerals Advisory Council.

Allen McDaniel writes, in part: "We moved here (Waterford, Va.) nine years ago to retire and lead the simple life on our northern Virginia farm. Now I am busier than ever with various professional and community activities." A newspaper clipping enclosed states that he prepared the plans, as consulting engineer, for the interior scheme of the Bahai house of worship, designated the "Temple of Light," at Wilmette, Ill. It was a circular-domed auditorium having a seating capacity of 1,600. The dome rises more than 150 feet above the main floor and is surrounded by nine arched alcoves and two galleries.

Allen also sent a very attractive and interesting booklet by the Waterford Foundation, of which he is president, entitled "Exhibit of the work of Artists and Craftsmen of Loudoun County, Va." A history of Waterford was given and descriptions of many old houses. Allen lives in the Fairfax Meeting House, a famous old Quaker meetinghouse, which he remodeled in 1939.

Harry White tells us that he is still sojourning in Florida winters and in Maine summers with brief visits to New Jersey spring and fall. — Ralph Stearns, formerly a hydraulic engineer, writes that he retired on July 1 and that his first grandchild was born last December.

Lammot du Pont reports that he retired in January from his chairmanship of the board of directors of E. I. du Pont de Nemours and Company. An Associated Press article states that his career with the Du Pont Company began in 1902. — It also says that he was the third of three brothers who served as president and to him fell the task of rounding out and co-ordinating an enterprise that, in a little more than a decade, has been transformed from a company mainly interested in the production of industrial explosives, to an organization manufacturing numerous products in the broad chemical field.

R. R. M. Carpenter writes that he is a director of the E. I. du Pont de Nemours and Company and a member of the salary and bonus committee, retired from active service. "After several years of big game hunting," he says, "collecting for the Academy of Natural Sciences, I have retired from that also."

Here, in part, is an interesting note from Ethel Gleason about one of our missing classmates: "Regarding Elizabeth Robins, for whom you have no address: One day while I was a student, I saw a lady alight from a carriage and go up the steps of Rogers Building on Boylston Street. Someone who was with me said, 'That's Miss Elizabeth Robins, the writer. She comes here to take lessons of Professor Bates.' The British 'Who's Who' for 1947 lists her thus: 'Robins, Elizabeth (Mrs. George Richmond Parks) (pseud. C. E. Raimond) actress and author, principally known as an interpreter of Ibsen's characters.' There follows a list of her novels, and other work published between 1894 and 1940, and her address in Sussex County and in London. 'Who's Who in America' for 1936-1937 states that she was born in Louisville, Ky. Presumably Miss Robins, in order to study with Professor Bates, at his office, was required to register as a student of the Institute. If you have any doubt that this distinguished woman was technically our classmate, she should be able to settle the question herself."

Frank Holmes writes: "I am retired, except for acting in an advisory capacity for my former principals a day or two a week. I have moved from Swampscott to the above address [Box 143, Amherst, N.H.] and am now enjoying life in a fine Colonial village in southern New Hampshire. We bought the first frame house built in Amherst in 1736. It's a large old salt-box completely restored, and in addition completely modernized for gracious living in this delightful community. In St. Petersburg this winter, I saw Al Higgins. He plans to come this way while on vacation in the North next summer, to have a look at this part of New England. He's the same old Al, and I did enjoy seeing him again. I had expected to see Ed Seaver at Clearwater, but a sudden call for some 'advisory' help brought me back before I got up there. If any of the 'brethren' get up this way, tell them to be sure and look in on us. My telephone is Milford, N.H., 16."

Here are some characteristic paragraphs from good old Ed Davis: "You'll probably hear from Russell Putnam that he is soon to join the brothers in retirement. For myself, I hope to be the last fellow to do it. Apparently, I've passed the climacteric, and now it will take dynamite to dislodge me. Such, you see, are the perils of business. Oh, yes, tobacco. I've decided not to swear off. It all results from an unexpected acquisition of a share of American Tobacco Company stock. Now, you see, it's about as broad as it is long. And besides, I do like my pipe."

We quote part of an article in the Boston Globe of April 13: "Dr. Francis Daniels Moore, 34-year-old general surgeon at the Massachusetts General Hospital, . . . was named Mosley Professor of Surgery at Harvard Medical School and Surgeon-in-Chief of the Peter Bent Brigham Hospital. . . . A pioneer in the operation known as vagotomy, he also has been concerned with vascular surgery for diseases of the blood vessels. Dr. Moore was one of the first men here to divide the vagus nerves in the lower part of the chest and the upper abdomen for the healing of stomach ulcers. His re-

search activities also have been concerned with thyroid physiology and cellular biochemistry." Dr. Moore is the son of our president, Phil Moore and Mrs. Moore. He was graduated at Harvard in 1935 and from the Medical School in 1939. — GUY C. PETERSON, Secretary, 788 Riverside Drive, New York 32, N.Y. THEODORE H. TAFT, Assistant Secretary, Room 3-282, M.I.T., Cambridge 39, Mass.

1903

John Candler Cobb, II, died on January 1. For a considerable time, he had made his home in Winnetka, Ill. — Robert G. Livermore has retired as vice-president of the Calumet Division of the Calumet and Hecla Consolidated Copper Company. He retains his position as a director of the company. — FREDERIC A. EUSTIS, Secretary, 131 State Street, Boston 9, Mass. JAMES A. CUSHMAN, Assistant Secretary, Box 103, South Wellfleet, Mass.

1905

Claude Anderson, XIII, steps into the breach this month with news about himself and some classmates. Thanks, Andy; every little helps. Andy's son, a major in the Regular Army, has been located at the Embassy at Belgrade for a year in charge of A.G.R.S. for Yugoslavia. He is now in Rome, and Andy hopes he can locate Norman Shapira '41, who has been with the American Embassy at Rome, but is now a civilian arranging for an export-import business, his partner being his father, Sam. Sam thought that if the Italian election should go anti-Communist, this would be a very healthy occupation for both; unhealthy for Norman if vice versa. Andy tells us that Piggy Bartlett was retired at Campbell Soup last winter but is retained as consultant.

Through his son, we learn that Jason L. Merrill, V, has been ill and is now living with him in retirement. The address is 427½ North Comstock Street, Whittier, Calif., and classmates in the vicinity would do a kindness by looking him up. John A. Meggison, VI, was to have retired from his position as electrical engineer for the Empire District Electric Company in Riverton, Kansas, after 30 years, but the company's inability to find a replacement kept him on the job. John, in a letter threatening to come on to a reunion soon (after an absence of 25 years), mentions grandchildren, how many we do not know. John Damon, VI, whom we mentioned in the March issue as being in Japan on government reparations work, is back in Boston with Jackson and Moreland. Thus two old pals, John and Frank Carhart, are reunited after 40 years. Wallace McBriar, II, sends just a bit of a note accompanying a check for dues, stating that he has done his bit toward keeping the population of the country on an even keel by having seven grandchildren — not a class record, however.

In June, 1946, having retired after 15 years with the department of housing and building of the City of New York, Charlie Mayer returned to his old home town, Madison, Wis., to live with his father, then 85 years old. Charley also intended to settle down, but the old urge to be of service wouldn't let him; so he is back in the game

(structural and reinforcing steel) with the Theodore Kupfer Foundry and Iron Company, of Madison. — Through Curt Babcock we learn that J. B. Whitmore, II, for many years with the Westinghouse Lamp Division at Bloomfield, N.J., has been incapacitated and forced to retire. Lacking further details, we can only hope that Whit is happy and comfortable.

In Detroit, early in April (on business this time), I had dinner with Helen and Waldso Turner, VI, at their hotel apartment (Sheraton) and that evening met their daughter Helen and son Rod, who, after graduation from Lehigh and the armed services, has joined his father in business (electrical contracting), apparently a very happy connection for both, as Casey says he is now on a 20-hour week and enjoying it. The following day, I looked up Edgar Bailey Cooper, II, who, under the name of the Cooper Construction Company, has been building larger and larger buildings, including one for the Turner Construction Company. Coop, who had not returned East (or at least to us) since 1915, had changed very little, has a full head of grayish hair, and looked tops. He has a son, a daughter, and three grandchildren. — FRED W. GOLDTHWAIT, Secretary, 274 Franklin Street, Boston 10, Mass. SIDNEY T. STRICKLAND, Assistant Secretary, 69 Newbury Street, Boston 16, Mass.

1907

Professor Charles E. Locke '96 gives me the information that Carl J. Trauerman has again been elected secretary-treasurer of the Mining Association of Montana, his address still being 505 Montana Standard Building, Butte, Mont.

During the early part of April, O. B. Denison '11 sent me the April copy of "Service," a publication of the Cities Service Company, in which there appears a first-rate cut and a very interesting story about John M. McMillin, who is financial vice-president of the company with offices at 60 Wall Street, New York City. This article tells how John began his career as a mining engineer in a desolate portion of Mexico. He did not enjoy this kind of work, and after about a year he became acquainted with Henry L. Doherty, through whom he soon began his career with the Cities Service Company. After varying experiences in different activities of the company, he was elected a director in 1922 and in 1940 became a vice-president. The article in the magazine mentioned states that John has directed the transactions in something like \$2,000,000,000 worth of business, his dealings having been with banks from Wall Street to Main Street and having represented mortgage bonds, debentures, note issues, and bank loans for the account of the Cities Service Company and its subsidiaries, and including many refundings and dealings for numerous electric light and power companies no longer with the system. This figure quite probably may be a record for any one man dealing exclusively in credit problems for such companies. John and his wife live at Forest Hills, Long Island, N.Y., and they have two sons who are also at work in the financial field, one at Tulsa, Okla., and the other at Phoenix, Ariz. John is a

member of the University Clubs of both New York and Chicago, the Westchester Country Club, the Lake Placid Club, and numerous others.

Through the courtesy of H. L. Carter '08, I have a clipping from the March 25 issue of the *Journal of Commerce* of New York City; this issue, being a special Canadian International Trade Fair number, contains an article written by our classmate, Clarence Howe, setting forth something of the accomplishments and the problems of the Dominion of Canada in connection with its domestic and foreign trade. The article also particularly tells of the Canadian International Trade Fair which is now going on from May 31 to June 12 in Toronto, Canada. Clarence states in his article that this trade fair was designed "as a stimulus to the return to private transactions in international trade and will offer the businessmen of the world an excellent opportunity to examine, compare and order many types of manufactured goods on display." It seems that this fair, which is sponsored by the Canadian Government, is the first of its kind to be held on the North American continent. There are some 1,500 exhibits, 40 per cent of which are from outside Canada, displaying goods from more than 25 different countries. In examining the material above referred to, I noticed that the title which was given to Clarence was minister of trade and commerce. This surprised me somewhat because as far as I knew, he was minister of reconstruction and supply. The situation was entirely cleared up by a letter that I received from Clarence under date of April 8 in reply to my letter to him, in which he states that the duties of minister of trade and commerce which he assumed last January 20 were superimposed on those of reconstruction and supply, which portfolio he will still retain until that department is liquidated.

In the May issue of *The Review*, I gave a new home address for Arthur Jansson as 85-10 34th Avenue, Jackson Heights, N.Y. As a result of my writing to Arthur on March 7, I was delighted to receive a letter from him under date of April 5 in which he says that this has been his home address for the last 10 years. He states that from 1922 to 1936 he was associated with the *Marine Review*, two years as associate editor at New York, and 12 years as editor at Cleveland, Ohio. From August, 1937, to the end of November, 1947, he was connected with George G. Sharp, naval architect at 30 Church Street, New York City. At present, he is on a special assignment with the Babcock and Wilcox Company, boiler manufacturers, of 85 Liberty Street, New York City. He is a member of the Society of Naval Architects and Marine Engineers, the American Society of Naval Engineers, the Propeller Club of the United States Port of New York, and the Technology Club of New York. He was married on June 14, 1916, and states that he is happy to say that he is still living with the same wife. They have no children. The following paragraph quoted from his letter will interest some of you: "Harold Wonson will remember that he and I were associates at the Bath Iron Works in the summer of 1907. Sharp and Loomis were also there. When you see him, ask him if he remembers visiting a United

States Navy Monitor then at Bath, Maine, to celebrate the centenary of the beginning of shipbuilding in North America at Popham Beach."

A letter dated March 25 from Willis Waldo from the University Club at Washington, where he was staying temporarily, states that he had just returned from Omaha, Neb., where he read a paper on ramie at the annual meeting of the National Farm Chemurgic Congress. — An item in the Worcester Gazette of April 10 states that Charles Allen and his wife had just returned to their home in Spencer, Mass., after a two-month sojourn in Beaufort, S.C. — I am notified by the Alumni Office that Frank W. Poland, who was associated with us in the Course of Mechanical Engineering, now has as his mailing address P.O. Box 447, Pocasset, Mass.

On April 28, I received word from the Alumni Office of the death on April 6 of John J. Thomas. I do not know any particulars but will seek to learn the facts and report in the next issue of The Review. John was a graduate in Mechanical Engineering and for two years was an instructor at M.I.T. In 1909, he entered the Army from civilian life and was an officer in the Coast Artillery and Ordnance Department until 1915, when he became associated with the American Can Company, where he remained until his retirement from active business about two years ago. During the latter part of his career, he was manager of manufacture for the company in their Pacific district with his headquarters in San Francisco. Plants under his supervision were located in that city, and in Oakland, Sacramento, San Jose, Monterey, Los Angeles, and in the Hawaiian Islands. John's home was at 99 Magellan Avenue, San Francisco. His wife died in 1941, and he is survived, as far as I know, by two daughters, one unmarried, and the other the wife of a professor at Stanford University, Palo Alto, Calif. He was very active in track events during our undergraduate days, and his genial smile and disposition combined with a sterling character made him then, as always, very popular among his associates. He was with us at Oyster Harbors last June, the first time he had been able to attend one of our class reunions.

The final report from the director of the Alumni Fund covering the fiscal year ending on March 31 shows that from our Class we had 112 contributors, which is exactly 100 per cent of our quota, and that the total amount given by members of our Class was \$3,309, which was 127 per cent of our quota. These figures may be compared with 114 contributors for the previous year and contributions amounting to \$3,637 for the previous year.

In view of a few deaths of classmates who had been generous contributors and a few decreases in gifts on the part of a few large givers due to unusual circumstances, I think that the showing of our Class, as stated above, is entirely creditable. We are now well started on the campaign for the year 1948-1949, and I hope that all of you who have previously given will continue to do so in at least as large amounts as formerly. BRYANT NICHOLS, Secretary, 23 Leland Road, Whitinsville, Mass. HAROLD S. WON-

SON, Assistant Secretary, Commonwealth Shoe and Leather Company, Whitman, Mass.

1909

In the Boston Herald of April 6 the following item appeared: "To Mr. and Mrs. George Burnham May (Ann James) of Hartford, Connecticut, a son, Kenneth Sargent May, 2d, April 4 at Hartford Hospital. Grandparents are Mr. and Mrs. Winfield S. James of Abilene, Texas, and Mr. and Mrs. Kenneth S. May of Newton Highlands." Congratulations to parents as well as grandparents. Ken, VI, enlightens us further: "At the present writing, my wife and I are blessed with seven grandchildren — five boys and two girls. My older daughter, Mrs. Henry Harwood, living in Waban within easy walking distance, has three sons and one daughter. This, as you can imagine, is a lively household, supplemented by three dogs, one cat, and I don't know how many rabbits. One Sunday afternoon recently we were entertained in the living room by the antics not of children but of three dogs (rat terriers), one rabbit, and one cat, all cavorting around the room in apparent good harmony. Our younger daughter, Mrs. John E. Dorer, lives in Snyder, N.Y., just outside of Buffalo, with her daughter and son. Although the above information is of a distinctly homely nature, it may give you some idea of the extracurricular activities in which my wife and I are engaging, involving baby sitting and trips to Hartford and Buffalo."

In the New York Times of April 18, a news item showed a photograph of Henry Ford, 2d, stating that he becomes national leader for Community Chests, succeeding H. J. Heinz, 2d, of Pittsburgh. Farther along the item reads: "Announcement of Mr. Ford's acceptance was made . . . in Atlantic City at the annual meeting of Community Chests and Councils of America, by Edward L. Ryerson of Chicago. Through Community Chests of America, of which Mr. Ryerson is president, more than 1,000 community chests all over the nation band together each October to raise funds for more than 12,000 local 'Red Feather' services for health and welfare needs." Ed, I, seems to be a leader in many big activities, such as the Chicago Opera.

In late April, we were pleased to receive a telephone call from George Wallis, II. He had just come from England in the Queen Mary and was stopping in Boston to pick up Marcia, who had been staying with the children at Wenham while George was away. Earlier, George had crossed in the Queen Elizabeth to visit a subsidiary of the Creamery Package Company, of which he is president. He expects to return to Boston in June for his annual summer trip to New England and spend part of his vacation on an island in Lake Winnepesaukee, where his daughter and her family have acquired a summer cottage. — PAUL M. WISWALL, Secretary, 90 Hillside Avenue, Glen Ridge, N.J. CHESTER L. DAWES, Review Secretary, Pierce Hall, Harvard University, Cambridge 38, Mass. Assistant Secretaries: MAURIE R. SCHARFF, 285 Madison Avenue, New York, N.Y.; GEORGE E. WALLIS, 1606 Hinman Avenue, Evanston, Ill.

1911

Our orchid of the month goes to Pete White, II — for on April 13 in the financial section of the New York Times appeared a fine half-tone of "Peter Desmond White, newly elected President of the Babcock and Wilcox Tube Company, Beaver Falls, Pa.," a well-deserved honor after 33 years of faithful service! As Don Stevens expressed it, in a congratulatory letter: "Never underestimate the power of a woman — if you had only got married when you should have, undoubtedly you would have been president of Ireland by now!" And speaking of marriage, it's great to have three engagements of the junior department of 1911 to announce this month.

General George C. Kenney, I, commanding general in the Strategic Air Force Command, and Mrs. Kenney of Andrews Air Force Base, Maryland, announce the engagement of their daughter, Julia Churchill Kenney, to Lieutenant Edward Carl Hoagland, Jr., son of Mr. and Mrs. Edward Carl Hoagland of Louisville. A spring wedding is planned. The bride-elect was graduated from Bradford Junior College and from the University of North Carolina, Chapel Hill, N.C. Lieutenant Hoagland attended the University of Kentucky and the Citadel in Charleston, S.C. He is a fighter pilot in the 336th Squadron, Fourth Fighter Group, Andrews Air Force Base.

Mr. and Mrs. Lester M. Peterson of Newtonville announce the engagement of their daughter, Gail Barbara Peterson, to Reed Francis Stewart, son of Mr. and Mrs. O. Wellington Stewart of Hyde Park, Mass. Miss Peterson is a graduate of Radcliffe College. Mr. Stewart, now a student at Amherst College, served with the Navy for two years.

Mr. and Mrs. C. H. S. Merrill of Milton announce the engagement of their daughter, Constance Southworth Merrill, to Richard M. Cameron, Jr., of Concord, Mass. In commenting thereon, Fat Merrill, I, wrote: "They met at a Quaker Work Camp, although neither of them is a Quaker. Connie was graduated from Milton Academy last June, and Dick was graduated at the same time from Belmont Hill School. Both are now freshmen at Quaker colleges — Connie at Swarthmore and Dick at Haverford. Both want to go to a work camp in France this summer — each confident that 'everything will be all right.' But Connie's Old Man is not so confident and is reserving his permission to her. Mebbe the draft will solve my problem. Then there's my son. He is a freshman at Governor Dummer Academy, where he is struggling to keep afloat in the sophomore class. His preparation at the Fenn School, from which he was graduated last June, landed him in a class with older boys. I don't think that's so good."

From Charlie Maguire, I, head of Charles A. Maguire and Associates, Engineers, with headquarters in the Turks Head Building, Providence, R.I., and a branch office at 46 Cornhill, Boston, comes a bound copy of the Boston Metropolitan Master Highway Plan. This comprehensive report has been presented to Robert F. Bradford, Governor of Massachusetts, by the joint board organized by his directive of August 9, and is

based on an origin and destination traffic survey conducted by the department of public works in co-operation with the public roads administration plus the recommendations of the board's consulting engineers (Charlie's firm and two affiliates). In the opinion of the board this program would take at least 10 years to complete, but it adds that "for the first time the State now has a plan based upon reliable factual data, data supplied by the people themselves. . . . It might, therefore, be paraphrased, not as the joint board's plan, not as the consultants' plan, but as the people's plan."

We may all be proud of Charlie for his accomplishment to date in this important forward step, for the board — comprising the Commonwealth's commissioner of public works, the chairman of the state planning board and the commissioner of the Metropolitan District Commission — included in its statement: "It has been a pleasure to work with the consultants in the formulation of the Master Plan. Their diligent and intelligent approach to the problem has resulted in the splendid, comprehensive report appended hereto, prepared independently, with a free hand, and based solely on factual data."

Monk de Florez, II, was principal speaker at the annual dinner meeting of the Tufts College Medical Alumni Association in the Hotel Somerset, Boston, on April 7, discussing "New Engineering Developments in the Science of Medicine." Said the Boston *Globe*: "Admiral de Florez, U.S.N.R., a leader in naval aviation, declared engineering looked to the medical profession to determine the physical and mental capabilities of human beings in the operation of the engines of the future. 'The human being remains constant and will not change for many million years,' the Admiral and inventor said. 'If he is to man the machines of the future, to invade the air or the depths of the sea, to live in spite of new radiation and disturbances heretofore unknown, the science of medicine must assist him in training and shielding himself from circumstances with which he cannot cope.' Admiral de Florez, who helped immeasurably in developing the Navy's research program in the last war, said engineers could contribute to medical progress by developing tools to reduce effort and labor in both research and practice." Dr. Stanley H. Osborn '15, state commissioner of public health in Connecticut and younger brother of our classmate, Frank Osborn, III, was toastmaster.

In late March the L. and S. Bearing Company, Post Office Box 1072, Oklahoma City 1, Okla., issued this "important notice": "We are indeed proud to announce that Paul A. Cushman [VI], one of the foremost antifriction bearing engineers in America, has recently joined our organization. Rather than recite his accomplishments in this field, we have taken the liberty of reprinting Dr. Cushman's biography from 'Who's Who in Engineering,' and this announcement should be of particular interest to our customers and anyone interested in precision engineering, since Dr. Cushman is a pioneer in this field. His services are now our services — to you. This is a step taken by L. and S. in its program of expansion to bring you better service and better bearings, of superior qual-

ity, for all your needs." His professional record, as given in "Who's Who in Engineering" for 1948, reveals a wide experience in academic positions and industrial employment and considerable study, adding to his S.B. with us in 1911 an S.M. at M.I.T. in 1927 and an Sc.D. at the University of Michigan in 1932. He has published a number of books on material handling, thermodynamics, mechanical design, automotive engineering, and roller- and ball-bearing design and has written numerous articles on engineering and education. His memberships include the American Society of Mechanical Engineers, the American Society for Metals, the American Association for the Advancement of Science, as well as York Rite, Scottish Rite, and Shrine. In 1932, he married Mary Otilie Davis, and they are now living at 1212 Marlboro Lane, Nichols Hills, Oklahoma City 6, Okla. Paul and Otilie are regular attendants at our five-year reunions, and their many friends wish them much success and happiness in their Oklahoma career. Paul understands, by the way, that L. and S. is the only bearing company west of the Mississippi River.

Announcement was made in mid-April that Louis Golden, VI, had been chosen as 1948 chairman of the campaign of the Combined Jewish Appeal of Greater Boston.

If you failed to notice it, refer to the club notes on page II of the April Review and under the heading "M.I.T. Club of Quebec" read of Gus Frigon, VI, general manager of the Canadian Broadcasting Corporation, who spoke on "Radio Broadcasting in Canada." He was introduced by the Club President, Paul Kellogg, IX, of Stevenson and Kellogg, Ltd. Also present was Ted Lafrenière, XI, Minister of Health of the Province of Quebec; but Bill Pead, VI, Montreal Light, Heat and Power Company, apparently missed that particular meeting.

Our worthy Class President, Don Stevens, II, is this year president of the Ridgewood (N.J.) Republican Club, and during April he released to the New Jersey press a three-part story, titled "A Freshman in Politics." Primarily a defense of the "open primary" law recently adopted by the voters of New Jersey, the three articles contain also a plea for fair play for Senior Senator Albert W. Hawkes, whom many Jersey Republicans wanted to see nominated in April 20 primaries to succeed himself. In conclusion Don said: "I have been asked: 'What is the difference between a Republican and a Democrat today?' My answer is: 'A true Republican should stand for the principles of Washington, Jefferson, Jackson, and Lincoln. A New Deal Republican or a New Deal Democrat apparently stands for almost anything and believes in "spending and electing." I have been asked: 'What good is a Republican Club in the Republican Bergen County?' In these three chapters I have told in part how the president of a Republican Club can keep himself busy. Is it worthwhile, or am I just collecting more 'goat feathers?'"

In retrospect, Alumni Fund VIII, which closed on March 31, showed 1911, as always, in a very creditable position: in sixth place in total amount, in fourth place among all classes with 118 per cent of contributors' quota and in third place — that's right, third place — among all classes with exactly 200

per cent of our \$2,800 quota, for 144 classmates contributed \$5,600 and that isn't hay! Now for another fine showing by 1911 in the ninth of these Alumni Funds, now under way, we ask your complete co-operation.

These notes are scheduled for publication shortly before Alumni Day, Saturday, June 12 — so if you haven't already made arrangements to attend, **DO IT NOW!** — ORVILLE B. DENISON, Secretary, Chamber of Commerce, Gardner, Mass. JOHN A. HERLIHY, Assistant Secretary, 588 Riverside Avenue, Medford 55, Mass.

1912

James A. Cook, VI, President of the New England Gas Association, presented an address before the 21st Annual Business Conference on recent and prospective developments in the gas industry and on the place of the Gas Association in this field. The association has had a most successful year under his guidance. A picture of the officers appeared in the Boston *Globe*, with Jim in the place of honor in the center of the group. In addition to his duties as vice-president and general manager of the Lynn Gas and Electric Company, Jim has been active in association affairs for many years. Photography is his most recent hobby, as those who attended the 35th reunion will remember. He is also active in class affairs and has ably helped out your secretaries with news items and correspondence.

A brief note from David Follett, Jr., III, Vice-president of the New England Lime Company at Adams, Mass., states that his family consists of wife, daughter, and grandson. His hobbies are bridge and fishing. He does not see any classmates frequently. — FREDERICK J. SHEPARD, JR., Secretary, 31 Chestnut Street, Boston, Mass. LESTER M. WHITE, Assistant Secretary, 4520 Lewiston Road, Niagara Falls, N.Y.

1913

I had a very pleasant visit in February with Sam and Mrs. Rogers at their home on Siesta Key, just outside Sarasota, Fla. Sam gave up business two years ago, and since retirement is in prospect for some of us, it was interesting to observe how it can be worked out. Sam chose Florida because when a small boy he lived there for several years on his grandfather's fruit farm and became attached to that part of the country. He has some 17 acres, an attractive house, comfortable in size, and a beach on the Gulf. I tried out the beach on a day of brilliant sunlight, when the air was 86 degrees and the water about 72, and it was delightful. The powdered shell "sand" is almost white, smooth and easy on your bare feet; the surf was pleasant to ride without too much exertion; and the color of the water, a sort of turquoise, is beautiful. Sam finds enough work to do on the property, indoors and out, to keep him in good physical condition. Mrs. Rogers takes good care of the matter of social contacts, and she has a good field for her interests in welfare work. I am sure that if you asked Sam the question, "How's retirement?" he would say, "Swell, come in — the water is fine."

It is my sad duty to report the death of two classmates, Arthur Bellis, V, and Joe Strachan, I. On March 27, Arthur was found slumped against the door of a lavatory

"Come Back to Tech . . ."

in his factory, at Branford, Conn.

Joe died at his home, in Pittsburgh, on April 2. He had written me on February 26, as follows: "For your interest, enclosed are copies of two talks I recently made which deal with topics not limited to steel industry applications. Always subject to change without notice, I now plan to attend our 35th reunion next June and look forward to a good old-fashioned visit with you at that time. Meanwhile, I trust everything goes well with you and your family. Our oldest lad, Dick, is on his own in Canada. Peter is a senior at the Gunnery School in Connecticut, and Hugh — our 14-year-old 'baby' — is a freshman at Shady Side Academy here."

The "talks" to which Joe referred were one on "Business Navigation" given before the American Marketing Association in Pittsburgh, last November 25, and on "Coal — the Industrial Lamp of Aladdin," before the Montclair Society of Engineers in New York City on February 3. Both papers impressed me at the time as having been written with the full possession of Joe's mental and physical powers, which I have always considered to be remarkable.

The following was printed in the obituary section of the New York Tribune of Sunday, April 5: "Joseph J. Strachan, general staff manager of the sales department of the Carnegie-Illinois Steel Corporation, died [on April 2] at his home. Mr. Strachan was born in Wilmington, Del., the son of the late Robert Charles Strachan, the engineer who designed the terminals of the George Washington Bridge over the Hudson River. He was graduated from . . . Technology in 1913. Until World War I he was with Westinghouse, Church, Kerr and Company, of New York, as a construction engineer. During World War I he was a lieutenant in the Navy Engineer Corps. Subsequently Mr. Strachan was with the General Chemical Company, Congoleum-Nairn, Inc., and Sanderson and Porter, of New York. In 1940 he became chief engineer of the Carnegie-Illinois Steel Corporation. He was a member of the board of deacons of Shadyside Presbyterian Church, the American Iron and Steel Institute, the American Society of Civil Engineers, the Pittsburgh Chamber of Commerce, the Duquesne Club, the Engineers' Club of New York and Kappa Sigma. His wife, Mrs. Mary Louise Hartich Strachan and three sons, Richard H., Peter H. and Hugh H. Strachan, survive." — FREDERICK D. MURDOCK, Secretary, Murdock Webbing Company, Box 788, Pawtucket, R.I.

1914

On the evening of March 23, Charlie Fiske, working with Paul Owen, arranged for a dinner meeting at the Yale Club. The occasion provided an opportunity not only to renew old acquaintances but also to discuss our 35th reunion of next year. The general consensus was that the preferable location would be between Boston and New York. This is even more desirable at present because Alumni Day at the Institute is still on Saturday, which makes it very difficult to tie it in with week-end reunions. Attending the dinner were Affel, Crankshaw, Ross Dickson, Faunce, Fiske, Gould, Hadley (who came down from Bridgeport), O. C. Hall, Mayo, Ober, Perry (who came in from Torrington,

Conn.), Spitz, Townsend, Whitwell (who came up from Philadelphia), and your Secretary.

Ray Dinsmore again makes the headlines. Ray, who is vice-president in charge of research for the Goodyear Tire and Rubber Company, will go to London to be presented with the Colwyn Gold Medal of the rubber industry. The award is in recognition of his work in synthetic rubber and is given annually for conspicuous services of a scientific or technical character having an important bearing on the rubber industry.

Dean Fales was featured in the April eighth Manchester Union. Two photographs showed Dean demonstrating how to make cars less fatiguing to drive through changes in the seat mounting and by increasing the size of the steering wheel rim, the former being accomplished by use of a small block of wood and the latter by slipping a miniature rubber tire over the steering wheel. Dean also said to paint out the chromium on the dash and around the windshield with flat black paint.

John Haven Stone, who was with our Class only during the freshman and sophomore years, died of a heart attack while walking near his home in Ridgewood, N. J., on March 17. Stone retired some years ago from the brokerage firm of Cassatt and Company of New York. No immediate family survives him.

H. E. Lobdell '17, the Executive Vice-president of the Alumni Association, visited the M.I.T. Club of Monterrey, Mexico, in February and met there our classmate Eugenio Garza-Sada, who is general manager of a large brewery in Monterrey. Sada is very active in the Technical Institute in that city and has done much to assist in establishing its high technical standing.

Arthur Peaslee's daughter Marcia was married at West Hartford, Conn., on April 10 to David D. Frank, who is on the staff of the Wall Street Journal. They will make their home in Rye, N.Y. — H. B. RICHMOND, Secretary, General Radio Company, 275 Massachusetts Avenue, Cambridge 39, Mass. CHARLES P. FISKE, Assistant Secretary, 1775 Broadway, New York 19, N.Y.

1915

"To do good and distribute, forget not!" ring out these old words with your contributions to start off the ninth year of the Alumni Fund. By now, the Fund should be so firmly fixed in your hearts and your minds that there's no need for me to press you with solicitations. Just give!

After not having seen nor heard from Harvey Daniels since 1930, we are glad to have his letter to relieve our apprehension of his fate while in Japan, where he had been for many years. His address is G-4 Petroleum, General Headquarters, Foreign Economic Co-ordination, A.P.O. 500, in care of Postmaster, San Francisco, Calif. "I want to acknowledge your letter of February 10," he says, "and apologize for being so incommunicative for such a long time. I have been back in Japan since October, 1945, attached to the Supreme Commander of Allied Powers in the role of a petroleum adviser. I made a trip home last summer and at that time thought I might get up to

Boston and drop in on you, but it didn't work out that way. I am afraid that I haven't any news of particular note, but a few months ago I joined the list of grandfathers, which, I understand, is no novelty among our class group."

Bill Spencer, 213 Cedarcroft Road, Baltimore 12, Md., writes as follows: "I have been exceedingly busy these past few weeks in this hectic world. My daughter, Elizabeth Barbara, decided to grab her man, and the wedding took place on the seventh of February. We have just gotten the last of the cartons and boxes out of the house, and Ethel and I are back where we started, just two."

A letter from Lloyd Chellman, 1954 Columbia Road, Northwest, Washington, D.C.: "I've been pretty busy getting organized on a new job with the Atomic Energy Commission. My family is fine; I still like my wife; our son is still going to art school and working in the art department of a newspaper at night; our daughter is an occupational therapist at Cushing Veterans Hospital in Framingham. Give my best regards to everybody I know in the Class of '15 — especially that Rooney person."

A short note from Arthur Ball, 12720 Highwood Street, Los Angeles 24, Calif.: "I'm dividing my time these days between Hollywood, Wilmington, Del., and Westport, Conn. I am leaving here shortly for several months in Connecticut and hope to get to Boston some week end!" Compliments from John Dalton, chief of the chemical department at the Pacific Mills, Lawrence, Mass.: "Good work, Azel, on all that you're doing to keep 1915 together." Thanks, John. John T. Bauer, 1964 Government Street, Mobile, Ala., is president of the Fulton Ice and Fuel Company, Alabama.

A fine letter from Parry Keller, 105 Fir Hill, Akron 4, Ohio: "I've mailed my check for dues in the businesslike envelope which you sent to us all. I see, from day to day, various Alumni of M.I.T., but seldom one of the 1915 vintage. Herman Morse has an office in the same building here at Goodyear as I, and I see him frequently and have lunch with him occasionally. I manage to keep busy with my tasks at Goodyear and travel occasionally. I still live at the University Club. Much of my spare time is taken up by various outside activities, including the Young Men's Christian Association and the University Club; at both places I am privileged to serve as trustee. I have become quite interested in color photography and help support the Cleveland Symphony Orchestra by attending regularly. My son is still in graduate school at the Case Institute of Technology in Cleveland and hopes to be granted his master's degree in mechanical engineering next June. He is having a very busy time of it; taking extra academic work, working on a thesis, and being a graduate assistant in the department of civil engineering and engineering mechanics. This latter job requires him to shoulder about one-half of an instructor's teaching load. I notice that Alumni Day is scheduled for Saturday, the 12th of June. I am planning to take part of my vacation at that time, and if everything goes according to schedule, you will see me in Boston then. Meanwhile, give my regards to the fellows I know at M.I.T."

Kebe Toabe writes that he has been wondering what I've been using to carry on the class activities. "I am sorry," he says, "that I was unable to attend the New York get-together. I was in Madison, Wis., that week end visiting Sidney and seeing Wisconsin take a beating from Michigan. But after the results of the Rose Bowl game, I didn't feel so badly. There seems to be nothing new around this part of the world. I do hope to see you in the near future, as I plan to get to New England this spring." Kebe's address is 408 Winthrop Place, Elizabeth, N.J.

Howard L. King, 50 Longview Road, Port Washington, N.Y.: "You are rapping gently indeed. It seems to me you always used to suggest a fiver. I saw Charlie Williams recently. He has a mid-town office where he is carrying on as a consulting engineer. I do not recall that this event has been noted in your column. Perhaps you should get a confession from him direct rather than print the story on information from me." Thanks, Howard, for the information on Charlie Williams, which he verified in his letter.

Then came a letter from Charlie Williams, whose address is 60 East 42d Street, New York City: "Enclosed is evidence of my unflinching class spirit. As you see from the masthead (not meathead) I have opened my own shop and, as the saying goes, am not making much money yet but having a H of a L of F. Our very best to you and Mrs. Azel, the lucky girl!"—Kenneth T. King, Du Pont Building, Wilmington, Del., declares: "There is nothing to write about myself except the same old grind. I have not been in Boston for two years or more. I do get to New York quite often. Do you ever get down there? I hope to see you soon." Royal R. Hinckley, Central City, Colo., must be on an interesting project! He writes: "I am 'way out in Colorado, and it is a wonderful state. I came out here 17 years ago looking for uranium and have stayed ever since. Now we are the center of intensive search for that scarce metal, which I hope we shall use only for commercial purposes."

Alton Cook, 63 Adams Place, Glen Ridge, N.J., has a sound idea of the regular collection of class dues, and I wish we could work it out that way: "Incidentally, wouldn't it be possible to have a regular system on class dues—say, a definite assessment due on January 1 of each year? It seems to me that with the reputed fine class spirit of 1915, it should hardly be necessary for you to go to the trouble of a special appeal every so often. Perhaps a brief résumé of this situation could be written up in the class notes. Possibly a consensus of opinion of the members of 1915 on the subject of dues might be in order. As for myself, I'm just plugging along as usual!"

Bill Tallman, 28 Fort Street, Fairhaven, Mass., writes: "I am still doing architecture in New Bedford with no letup in sight. My family still prospers and grows. Total accumulation: two grandchildren, Peter and Coralie; son Humphrey, who has gone lieutenant commander in the regular Navy and is now at Line School at Newport, R.I., one son-in-law, George Spooner, a junior grade lieutenant, U.S.N.R., also a flyer, based at

Squantum. I'll show up at some of the 1915 gatherings when I can let go the lion's tail."

Gardiner C. Wilson, 967 East King Street, Lancaster, Pa.: "When I last reported, I was a wee bit proud of having won the rank of technical ensign in the Coast Guard Reserve. Now, with that fracas over, about the only thing I can boast of is being the grandfather of two children and having a boy ready for college. I'm still with the Armstrong Cork Company (13 years) and am vice-president of the M.I.T. Club of Central Pennsylvania, after having put in four years as secretary. Seldom seeing any Tech men from 1915, I enjoy reading about my former classmates in *The Review*. I was pleased to hear of your succumbing to connubial bliss and trust all goes well."

A word from Ithaca, N.Y., penned by Harold Pickering of 409 East Buffalo Street: "I am struggling along as a 'small businessman,' dodging union difficulties, material shortages, inefficient labor, and so on. Two years ago, I ordered two air-conditioning furnaces which have not yet arrived. I lost a great deal of business because I refused to use some of the available junk. I'd like to sell my real estate at the current treble-value and get a job in Arizona—except that I hear jobs are nearly out of the question for outsiders. Have you heard of any classmates who need a stake-driver or a gas-pumper?"

Howard M. Sawyer, living at 136 Salem Street, North Andover, Mass., is president and treasurer of the H. M. Sawyer and Son Company, Cambridge, manufacturers of waterproof clothing, rainwear, and coated fabrics, the latter line being made at their Brunse Company plant, Watertown, Mass.—Sam Otis, 516 Walnut Street, Winnetka, Ill.: "I doubt that many will remember me because I took only a few special courses in Architecture, notably with the late Ralph Adams Cram, at M.I.T. At present I am engaged in remodeling the 20-story Standard Oil office building in Chicago, with a few lesser irons in the fire."—Lucky Charlie Malone, enjoying retirement at Roxbury Road, Stamford, Conn., writes: "I am not active in business now, and trying to live on an income during these inflated times is quite a problem. I have a farm in Chester, Vt., but do not work it; Mrs. Malone is very eager to try her 'green fingers,' but I have no illusions that a city slicker can beat the Vermonters at their own game."

And then Herb Anderson has to come out of retirement: "I always enjoy a word from you, even if it is for help. Instead of being retired as planned, I am moving faster than ever. I am executive vice-president of the H. Brinton Company, one of the oldest and larger manufacturers of circular knitting machines; also chairman of the board of the Haskell-Dawes Machine Company, manufacturers of cord, rope, and wire-twisting machinery. After I had convinced Alice of the merits of retiring this year as president of the Women's University Club of Philadelphia with its 1,200 members, she compromises by going on the board of three other worthy organizations!" Herb's address is Winding Brook, Prospectville, Pa.

Sol Schneider of 310 Washington Avenue, Havertown, Pa., is up there with the other

grandfathers. Time marches on! "I hope this item of news will HELP AZEL in his class notes. I joined the ranks of grandfathers two months ago, when my daughter Janet gave birth to a baby girl, Pamela Gray; she and her husband have recently returned from the West Coast and are planning to make their home in the East. I was sorry I could not get to the class dinner in New York two months ago. I know I missed a swell time with the boys."

With his generous check came a note from Frank Murphy, 45 Virginia Road, Quincy, Mass., saying, "Sorry I cannot make it more." How much does Frank think I want? —From John Homan, accompanied by a check: "Greetings, here's a little start for our class dues. In a pinch, call again! I live a routine life, work a little, play a little, earn a little." Ah, but John gives more than a little! Thanks, John. His address is 69 Ocean View Road, Swampscott, Mass.

What a trip Alan Dana is going to have! In the *Ansonia*, Conn., paper we read: "Alan S. Dana of 185 Wakelee Avenue, chief engineer of the Kerite company and president of the Seymour Rotary Club, will leave Friday night on a trip around South America before arriving for the annual convention of Rotary International which begins May 16 at Rio de Janeiro, Brazil. During his 14,000-mile round trip Mr. Dana will visit three countries in Central America, six countries in South America, and two islands in the Caribbean. He will have an opportunity to see the sights of Mexico City, Mexico; Guatemala City, Guatemala; Balboa and Panama in the Canal Zone; Lima, Arequipa, Puno and Cuzco, in Peru; take a boat across Lake Titicaca, visit Guaqui and La Paz, Bolivia; Santiago, Chile; Buenos Aires, Argentina; Montevideo, Uruguay, São Paulo and Rio de Janeiro, Brazil; Port-of-Spain, Trinidad, and San Juan, Puerto Rico. The flight, which will be made by Eastern Airlines and Pan American Airways, will take six weeks and the total flight will be more than the distance between China and France. Mr. Dana, who will be the delegate from the Seymour Club, will also represent the Ansonia and Derby-Shelton Rotary clubs at the convention."

Now, all these fine notes have been accompanied by checks for class dues. If you have not already sent in your check and a letter, please do so very soon. Be sure also to let me know if you are coming on to Alumni Day at the Statler Hotel, Boston, June 12. We'd like to plan a get-together before the dinner. My home telephone is Longwood 6-3438. I hope to be seeing many of you there.—AZEL W. MACK, Secretary, 40 St. Paul Street, Brookline, Mass.

1916

It is with deep regret that we report receiving word from Mrs. Carlton Spear in North Tarrytown, N.Y., that our classmate, Carlton Spear, died on March 13. At the time of his death he was employed by the Turner Construction Company of New York City. He was in charge of construction of research laboratories for the Johns-Manville Company of Manville, N.J. He was also a member of the Westchester County tax

commission. He is survived by his wife and a son, Warren McL. Spear '47; also by a daughter, Mrs. Robert M. Phillips, and a granddaughter, Joanne Helen Phillips. We wish to express our heartfelt sympathy to Mrs. Spear and the family.

With deep regret we list the death of John N. McDevitt. John died in February at his home in Palm Beach, Fla. He was the head of the W. H. McDevitt Land Company in Pawtucket, R.I. Your Secretary has extended the sympathy of the Class to Mrs. McDevitt.

Lyman Quincy writes as follows: "After 20 years of more or less 'postgraduate' experience with Du Pont, the Sun Oil Company, and Hercules Powder Company—always closely allied with the paint, varnish, and lacquer business in production, technical sales service, and so forth—I have at last settled down to my 'first love,' actual production and management in our industry. I came down here to Sumter, S.C., 10 years ago to build and operate a plant to manufacture our own finishing materials for a large southern lumber, furniture, plywood, and allied combine. The ultimate ideal of the 'top drawer' management is to make everything ourselves that we use in large volume; so far, finishing materials and hide glue are in production; others may follow. I could fill a page with my enthusiasm for the new and growing South—the last wide-open 'frontier' in America. They want us and need us. Let's have more of our young technical brains willing and eager to break loose from the old conservative North and come down where life is more worth living and there is plenty of room for all. For a day off there is an acre of beautiful beach for each man instead of one square foot as at Nantasket or Jones Beach, and hunting and fishing, the best in the land, at our front door." It is wonderful to find someone so enthusiastic. Lyman is the general manager of the Southern Coatings and Chemical Company.

Earle Pearson says that he is "still with the Hood Rubber Company, having lately completed 25 years. For several years I have been one of the production superintendents under Ray Blanchard, '17. A great guy! I have recently bought a small place in Wellesley, out in the country, where we can relax in our old age. We have one daughter who is married and has given us a little granddaughter now 21 months old. Like all grandparents, we think she is tops. As I stick pretty close to the factory, I don't see many Tech boys except our fellows at Hood. Perhaps I shall get in to the reunion in June." We hope you will come, Earle.

Frank Bucknam writes from Western Springs, Ill., as follows: "After graduation, I put in almost a year with the Pennsylvania Railroad, over a year and a half with the railroad regiment in the Army—most of it in France—and since June, 1919, I have been with the Factory Mutuals. The work is fire prevention and fire protection engineering, involving considerable hydraulics. I am married and have a daughter in Ely, Nev., and a son who is finishing junior college this spring after putting in about three years in the Navy. I am planning to attend the 35th reunion in 1951. In fact my 'boss,' who was in from Boston last week and is

an M.I.T. man, told me I should not miss it." And you shouldn't.

We were all very proud to have the opportunity of voting for Steve Brophy for term member of the M.I.T. Corporation on the 1948 ballot of the Alumni Association. Steve has been very modest about his attainments, but these were so nicely drawn up on the information accompanying the 1948 ballot given to all members of the Alumni Association that we shall not reproduce them here. Later news of Steve reports that he has been elected chairman of the American Association of Advertising Agencies.

Steve Whitney reports that skiing at "Whit's End" has been washed out by the weather. He was last seen using Napoleon brandy in lieu of ski wax. — The Providence Bulletin informs us that Lauriston E. Knowlton has been made vice-president and engineer of the Providence Gas Company. He joined the company in 1919 and has been in the operating department as plant superintendent, general superintendent, and engineer. He has been a director of the American Gas Association and a past president and director of the New England Gas Association. He is also president of the Family Welfare Society of Providence.

Phil Baker gives us a flash about Bob Wilson: "Bob Wilson of Standard Oil Company and our Class gave an address here in Detroit before one of the engineering societies and apparently was very well received. Cy Guething and I had hoped to have a little class reunion here for him. Cy, however, went out of town, and I was unable, after a number of telephone calls, to locate Bob before his banquet." — Ferg Shuey on the 30th of March was celebrating the birth of his first grandson, Henry M. Shuey, Jr. "His father is with Rohm and Haas in Philadelphia. Our oldest son, John, is a lawyer in Shreveport, and the third one is working for his master's at Miami University." — A letter from Tom Holden includes a schedule of addresses he has given in the last months in Miami, New York, Cincinnati, Chicago, and Buffalo. You sound pretty busy, Tom.

Dick Rowlett writes that he is in New York handling the eastern part of the country for the Brown Bridge Mills, Inc. "I bought a house," he says, "out in Manhasset, where Helen and I live a rather quiet life. My son, Tom, is in the Chicago office of this company, and my daughter, Caroline, is married to a veteran just completing his senior year at Washington and Jefferson College. My 16-year-old daughter, Jane, is in the MacDuffie School for Girls in Springfield, Mass. I had a very enjoyable luncheon with Steve Brophy a few weeks ago and am planning a repetition as soon as I recover from an arduous paper convention that has been in town recently. Aside from Steve, I haven't seen or heard from any of the crowd."

Hovey Freeman tells us that his third daughter is getting married—only one more to go! He reports: "No other news than to say that I must admit I am getting old, as I am resigning from things and trying not to do so much rushing around. I decided that being a director or trustee or officer of some 19 different organizations seems foolish these days when the government gets a lot more

of my income than I do myself." A very sensible remark, Hovey!

Jack Camp called me from Boston a short time ago. He was on his way to Canada, flying his own plane. He said he'd spent several days in New York with George Maverick and Bill Farthing. They were both well. A few days later I almost had tea with Bill, but the weather intervened. Bill said he had had a nice visit with Jack, and that he was looking very well. My daughter, Cynthia, is engaged to Peter Barrett Robinson, son of Herbert W. Anderson, '15. That means more trouble with these notes. For the second time this year, I'm looking for a secretary. I don't know whether I'm running a business or a marriage bureau! I should appreciate some co-operation from you, boys—even a penciled note is better than nothing.—RALPH A. FLETCHER, Secretary, Post Office Box 71, West Chelmsford, Mass. HAROLD F. DODGE, Assistant Secretary, Bell Telephone Laboratories, 463 West Street, New York 14, N.Y.

1917

An auspicious event worth recording in the history of the Banks of the River Charles occurred on Tuesday, April 6. It was the christening of a racing shell donated to the Institute by that renowned swine and rose fancier of the great Northwest, namely Neal Tourtellotte. Alumni Executive Vice-President Lobdell succeeded in breaking a bottle of genuine White Horse Scotch over the beautiful shell without cracking same amidst drooling cracks of wit and witlessness from those in attendance. The shell was named the "Ralph T. Jope '28" in recognition of Ralph's constant efforts in the support of undergraduate athletics, which also have been one of Neal's interests. A representative group of 1917 men was present for the ceremony to represent the donor. Tom Ryan, who now is the distributor for Sound-scriber in the New England area, brought along one of his instruments, and Lobby's speech was thereon recorded along with greetings and congratulations from the assembled '17 men, and the record was sent to Neal, where no doubt it will have a place of honor along with his certificates as midwife for laboring service. The members of 1917 present were Rudy Beaver, Ted Bernard, Ray Blanchard, Nelson Chase, Chris Crowell, Art Dickson, Jim Flaherty, Joe Gargan, Lucius Hill, Al Lunn, Tom Ryan, Ray Stevens, Henry Strout, and Jack Wood. After the ceremony, the said worthy representatives of the Class retired in a body for discussion and refreshment.

A communication from Dud Bell reveals that he is back in commercial life with a sales agency, keeping his nose to the grindstone but still finding time to dabble in his play-writing activities. Business takes him to Chicago now and then, and on his last visit he spent an evening with Penn Brooks and his family. Dud writes that he had a letter from Dutch du Pont who, after a very severe fight for life against a prolonged illness, is now in fairly good shape.

Word comes from Sherry O'Brien that Mac McGrady was in Chicago in mid-April, and although they were unable to get together, they did have a prolonged telephone conversation. Mac volunteered the informa-

tion that Commodore Sullivan expects to be out of the Navy by June or July. He intends to establish himself as a consultant on ship salvage, doing appraisal work for the insurance companies, and will probably share an office with Tom Meloy in New York City. Mac and his missus are planning an extended trip to the West Coast in August, but he hopes to tarry long enough in Chicago to confer with the gang. On telephoning Penn Brooks, Mac learned that he is spending most of April on his farm in Virginia, during the spring plowing no doubt. Editor's query: By the time our 35th reunion rolls around, how about a hog-calling contest between Penn and Neal? Committee on activities, please note. The Chicago members of the Class had an opportunity of getting together on April 22 when the Chicago Club staged its annual banquet and entertained Dr. and Mrs. Compton, with the wives and sweethearts of club members in attendance. Incidentally, on March 29 at the meeting of the Alumni Council, Sherry O'Brien was elected a member of the Alumni Fund board for a period of five years.

Stan Hyde, the Yarmouth Dominie, essayed a trip in January to the Alumni Council meeting via automobile from Portland, Maine. He found the going smooth in Maine, in fact until he got to Saugus. From then on, he battled the snows of Malden, Melrose, Medford, and Somerville and found his assault on Cambridge baffled at every turn. He finally wound up at Winchester and from there headed back to Portland, leaving behind him definite sulphurous remarks to the effect that the Down-Easterners could teach the Bay-Staters something about handling snow. Stan passes on to the gang, with rights to use same, his definition of the 1917 boys, as Middle-Agers. It is "that age at which you are just as good as you ever were, or at least you will be in a day or so."

It is noted in the press that the first Catholic Church of Colonial design ever built in the Archdiocese of Boston will be erected this fall at Rockport. It will take the place of a structure built in 1856, one of the oldest Catholic churches in the archdiocese. The architect of the new structure is our own Bill Colleary. — Rad Stevens, the bottling machine manufacturer of Elgin, Ill., informs us he has passed one more milestone on the road to grandparenthood. His son Al, who is now associated with him, after graduation from the Babson Institute, was recently married. As evidence that the good deeds men do also live with them, Rad was appointed cheerleader for the Chicago Compton Dinner mentioned above in these notes. — Frank Peacock, after many bouts with insurance companies, Federal and New York State power commissions, legal matters, and so on, expects soon to be busily engaged in the construction of a hydroelectric power project in upper New York State.

Ted Bernard has been busy of late in behalf of the Institute, by way of two communications to various members of the Class. The first of these, dated March 16, enclosed a booklet describing the new Co-operative Foundation Plan, whereby one may take out an insurance policy with the Institute as beneficiary, such that after the first year the Institute pays one-half the premium and the

insured the other half, which is a deductible item for income tax purposes. It offers a semipainless method of doing something worth-while for the Institute. Ted's second communication has to do with the possibility of inaugurating a plan whereby the Class will be in a position to make a worth-while gift to the Institute on the occasion of our 50th reunion. It is not too early to begin to think of ways and means of putting a plan into effect. Hence any feelings and ideas that any of the class members have on the subject will be gratefully received by Ted.

Our Assistant Secretary also passes on the information that a letter from Frank Maguire states that the company he has been with has been bought out by the Sun Chemical Corporation and Frank has been transferred to New York, where he is assistant manager of buying. He is kept busy buying for 21 different plants throughout the country such materials as paints, varnishes, textiles chemicals, coated papers, and machinery. Frank said he had a visit from Leander Hills, who is now with the Irvington Varnish and Insulator Company of Irvington, N.J., where he is in charge of resin production.

Just as we were about to close these notes to meet the editor's deadline, word came from Sherry O'Brien that on Friday, April 16, he met his old grammar, high-school, and M.I.T. classmate, Walt Whitman. It was on the occasion of the dedication of the magnificent new research laboratories of the Standard Oil Company of Indiana at Whiting, Ind. The ceremony was followed by a dinner at the Stevens Hotel in Chicago, where Sherry and Walt had a good visit. The highlight of the evening was when Dr. Arthur Compton, the principal speaker, during his talk on "Freedom with Peace," gave an eyewitness account of the first successful fission experiment held under the stands at Stagg Field, Chicago. Walter was able to kill two birds with one stone, as in the following week he took in the first two days of the American Chemical Society meeting. Sherry also encountered Josh Whetzel at the Standard Oil Company's festivities. He is now mill assistant in charge of the tin plate division of the Steel Corporation. He also, like Rad Stevens, is on the road to grandparenthood, a son having just married. Josh has another son in his junior year at Princeton, and a daughter enters college this fall. On the honors side, Josh is president of the Canning Machinery and Supplies Association.

Win McNeill, evidently looking around for something to worry about, after reading Cordell Hull's *Memoirs*, plus Drew Pearson and others anent democracy, believes the class members have now matured enough that they should take a more active interest in making democracy work. Anyone with ideas on the subject is requested to communicate with Mac.

Phil Cristal has sent us the information that Bill Cargill last fall became chairman of the board of the Ray-O-Vac Company at Madison, Wis. He has continued to be active in company affairs and in other worth-while civic projects. Because of the fact that Madison is in the district of the M.I.T. Club of Milwaukee, Bill has graciously agreed to serve as a director of the Madison group, acting as a center of influence among

the M.I.T. Alumni, who are largely on the faculty of the University of Wisconsin.

The readers' attention is called especially to the artfulness with which the ghost writer inserted "word came from Sherry O'Brien." Actually, the above notes were written by the aforesaid O'Brien, whose genial and refreshing touch is apparent.—RAYMOND STEVENS, Secretary, 30 Memorial Drive, Cambridge 42, Mass. FREDERICK BERNARD, Assistant Secretary, 24 Federal Street, Boston, Mass.

1919

The Bell Laboratories for March on page 128 carried a story and picture of Paul Blye, whose voice on the microwave call made 12 round trips, or 5,280 miles, between Boston and New York at the Walker Memorial mid-winter meeting on February 7. The same page tells of changes in organization of the Bell Telephone Laboratories, and we are pleased to note that Fred Given was appointed assistant director of transmission apparatus development.

Lewis Hartman said hello to the Class in a note from Lancaster, Pa. Word was also received from Albert Reynolds in Morristown, N.J. Frank Reynolds writes as follows: "I suppose this letter is 'way overdue. I seem to have been so busy raising and educating a family of four that I haven't had much time for other affairs. Now they have all flown the coop. My older boy is married and working for his master's in chemistry at the University of New Hampshire, where my younger daughter is also a student. My older daughter is married and living near by in Walpole and has two children—which makes me feel old. My younger boy was graduated from Northeastern as a civil engineer in January and is with the Seismograph Service Corporation in Oklahoma. As for me, I am in my 24th year with Bird and Son, Inc., where I was recently made director of research after climbing through the various steps including the position of chief chemist for two different divisions."

Dick Holmgren drops a line from California, saying: "I have now become a booster for California sunshine and living in general. We have just completed a pipe line which delivers water at a point in southern California 300 miles from where it leaves the Colorado River. Southern California is experiencing a drought, and were it not for this line, water conditions would be bad. How about the reunion in California?" — We regret to note that Al O'Donnell has affiliated himself with the Class of 1918. Webster B. Shippey, on the other hand, now located at Rapid City, Mich., and for a time with the Class of '26, has rejoined the Class of 1919. Your Secretary noticed an account in the *Scarsdale Inquirer* in April listing John L. Riegel, President of the Riegel Paper Corporation, as a member of "Who's Who In America." The Class is proud to make this announcement.

E. G. D. Paterson of Tuckahoe, N. Y., sent a brief line: "I'm looking forward to the 30th reunion. I had to miss the 25th. No news and no ideas yet." Jack Fleckenstein mailed a card from Tucson, Ariz., saying: "I'm out here on vacation. Lovely weather. Still looking for crude oil and no results so

far. If you hear of any crude available, please let me know."

E. A. Richardson of Bethlehem, Pa., dropped a few lines announcing that he had adopted a baby boy 10 days old on December 31. Name, Robert Howard Richardson. With regard to his work and the 30th reunion, he writes: "I have had several months' work for the Bethlehem Steel Company and the American Iron and Steel Institute in specifications, light-gauge sections, also manual. A paper, on heat transfer of impermeable bodies with fluid flow, in the American Society of Mechanical Engineers' Mill, covers insulating gas turbines so that high temperatures can be handled with low-temperature material. I do hope the 30th reunion will be held where good swimming is close by; golf is of no interest, and I can go 10 miles to swim at home. More news later."

Ed Deacon has moved from Clinton, Iowa, to 4 Greenwood Road, Biltmore, Asheville, N.C. Shee M. Lee has moved from Chungking, China, to Bureau of Education, 80 Matang Road, Shanghai 12, China. Henry E. Wilson's new address is 79 Country Road, Ipswich, Mass. — EUGENE R. SMOLEY, Secretary, The Lummus Company, 420 Lexington Avenue, New York 17, N.Y. ALAN G. RICHARDS, Assistant Secretary, Dewey and Almy Chemical Company, 62 Whittemore Avenue, Cambridge 40, Mass.

1920

By the courtesy of O. B. Denison '11, Vice-president elect of the Alumni Association, I am informed that Norrie Abbott has been elected president of the Massachusetts and Rhode Island Young Men's Christian Associations. Robert H. Aborn is now in Short Hills, N. J. Austin Higgins has returned from overseas and to private life. He was a colonel in the United States Army. His present address is 255 Drake Avenue, New Rochelle, N.Y. Charlie Klingler has left California and is now in Milwaukee at the Hotel Astor. Paul Pierce's address is 135 Newbury Street, Boston. — HAROLD BUGBEE, Secretary, 7 Dartmouth Street, Winchester, Mass.

1921

Our Class President, Ray St. Laurent, held a meeting in New York during April with Zam Giddens, chairman of our class gift committee, Dan Harvey, and your Secretary in order to formulate our program with respect to the plans proposed by the Institute for the Memorial. Details will go out in the mail at an early date.

George Chutter is the first of the Secretarial Committee to report this month. Writing from his Jersey City office, George says: "I spent an evening in Schenectady recently and had a most pleasant visit with John A. Scott. You will recall that Course VI-A had several members who were married during our undergraduate days, in fact a few, like John, even had children back in those times before the G.I. Bill and all the present routine. Elizabeth Scott, the eldest daughter, was pretty well known then as 'Gus,' a nickname bestowed by Ralph Gilbert. John's two older daughters are married and each has children. The youngest girl, June, will be graduated from Purdue this

summer. The grandchildren are all boys. John is working in the general engineering laboratory of the General Electric Company, and his wife, Wilma, has been actively interested in family life instruction in the School of Adult Education in Schenectady. Having raised a fine family and done considerable advanced work at Vassar in the field of family relations, she is well qualified to teach and enjoys it immensely. Her work is frequently in the news and has been called to the attention of Governor Dewey."

Old Faithful Walt Church maintains the honor of Oregon and Course IV with a letter in the following mail, right behind George Chutter's notes. Walt's latest contribution to his perfect record in answering our requests for news reads: "The members of the Class around here are still too law-abiding and too busy to produce any newsworthy items. I think the gang would get tired of the same old four names, but since that is all there are here, I can't do much about it."

"Three of us are architects, and I can report at first hand that all our firms are more than busy these days. Irving G. Smith's organization has recently completed the big new Equitable Building for Ralph Cake, brother of our Cookie. The latter's concern furnished the acres of cold cathode lights throughout the structure. This is rated as one of the most modern office buildings in the country. It and the new Oregonian Building by Jimmy Smith's firm for the morning newspaper are both heated and cooled by the reverse cycle refrigeration method."

"Glenn Stanton's firm has been doing a lot of varied work, one of the most interesting projects being the large Veterans' Hospital in Klamath Falls. Glenn has been nominated for national vice-president of the American Institute of Architects, and we hope for his election in June at the convention in Salt Lake City."

"Our firm has been working on a new State Office Building in Salem, which is to be a part of the State Capitol group. We were the associate architects on the new State Capitol Building and the architects for the State Library Building, the third one of the present group. We are also doing a building here in Portland which will have the greatest floor area of any building in the State. Things are not dull in the construction industry."

Sumner Hayward keeps up a perfect record for newsgathering with a note saying: "I saw Asher Cohen and Harold Stose at the last meeting of the M.I.T. Club of Northern New Jersey and had George Chutter as my dinner companion. My son has been working for the American Telephone and Telegraph long lines department in a construction crew since early this year. He is seeing the country, having started in Elkton, Md., and moving to New Haven and then to Hartford."

Among those listed in a recent announcement of the new professional engineers certified by the State of New Jersey is Donald B. McGuire of Middletown, N.Y., where he is still with the Rockland Light and Power Company. Lincoln B. Barker, metallurgist of the General Electric wire mill at Schenectady, has moved to a new home in Alplaus, N.Y. The syndicated "Their Birth-

days" column in the daily press for April 7 extended greetings to Stanley L. Scott, major general, commanding officer in Alaska and native of New Albany, Ind.

Our Class Agent, Larcom Randall, wants us to thank all of you for backing him up with 101 per cent of quota in amount and 94 per cent in number of contributors to the Alumni Fund for the fiscal year which ended in April. Always the huckster, he adds: "For immediate purchase—your share in the world's finest engineering and scientific institution. No matter what you pay, it's still worth more. Invest now and avoid nasty letters from the Class Agent." Lark deserves special commendation for the superb job he has done. There's no better way in which we can express appreciation than by returning the cards for the 1948-1949 Fund now.

You fellows must have gone for our advertising of the Sheraton hotels in a big way. Ernest F. Henderson, President, and Robert L. Moore, Vice-president of the Sheraton Corporation of America, have reported in financial circles a tremendous rise in the last year's operating revenues of their enterprise. Our own pleasant experiences with several of their excellent hostleries would suggest bouquets for Ernie and Bob for having particularly capable and well-trained personnel to top off a high rating for the normal facilities.

David O. Woodbury heads the entries in the literary department this month with a book and an article. John Wiley is advertising Dave's *Battlefronts of Industry*, a 330-page dramatic story of the Westinghouse Electric Company, symbolizing American industry as a whole in its outstanding contributions toward the winning of World War II. Dave's intense interest in the 200-inch telescope mirror at Palomar, which resulted in his book of some years ago on *The Glass Giant of Palomar*, led to an article in *This Week Magazine* entitled "Just Ask Porter." The subject of the article is Russell W. Porter '96, who was secured by the late George E. Hale '90 in 1928 as the architectural consultant for Palomar.

Manuel S. Vallarta, professor at the University of Mexico, is an editorial associate of *Transmisiones*, a monthly review of electrical communications services which is published in Mexico City.

Philip H. Hatch and Charles A. Williams authored papers which were presented at the northeastern district meeting of the American Institute of Electrical Engineers at New Haven, Conn., in April. Phil, who is in charge of diesel-electric motive power for the New York, New Haven and Hartford Railroad, spoke on "Highlights of Electric and Diesel-Electric Locomotive Operation." Charlie collaborated with an associate in the United Illuminating Company, of which he is vice-president, on a paper entitled "A Quick Look at the Heat Pump." Our recent inquiry to Charlie about the report that he is the latest addition to the list of grandfathers brought his response with the glad tidings that Charles Merritt Barker arrived on March 9 to his daughter Molly and her husband, who live in Milford, Conn.

Max Burckett telephoned to say that he is still with the Morse International Division of Vick Chemical Company and regretted

his inability to join in welcoming the Executive Vice-president of the Alumni Association and Publisher of The Review to the April meeting of the M.I.T. Club of Northern New Jersey. Present to greet Lobby were Asher Cohen, Sumner Hayward, Fred Kowarsky, Harold Stose, and Cac Clarke. Fred is a member of the Club's board of governors, and George Chutter heads the placement committee.

Harry I. Granger continues as the treasurer of the Town of Weymouth, Mass., where he has made his home for many years. Michael V. Sacharoff is reported to have left Beverly, Mass., and to have taken up residence in Phoenix, Ariz. Andy Jensen is living in Boston at 327 Beacon Street. Douglass E. Brown and Edward G. Sparrow are both living in New York City, and Leland S. Barnes has moved from Waltham, Mass., to a new home in Sierra Madre, Calif.

San Hill of Wilmington, Del., and Trev Peirce of Philadelphia both say that 1921 news in their respective areas has hit a record low. They are busy stirring up the brethren to neutralize this unnatural silence by joining the mass pilgrimage to Alumni Day on June 12. Chick Kurth and Bob Miller are expected to be on hand at the class headquarters at the Statler to show our various reunion pictures at 4:00 p.m. on the afternoon of Alumni Day. Look up the room on the hotel bulletin board. If you have movies, slides, snapshots, or other interesting memorabilia, bring them along.

Le Roy M. Hersum, consulting engineer of 6 Beacon Street, Boston, sent a welcome reply to our inquiry about his war service, which reads in part: "After a month with the First Division at Fort Benning in April, 1940, and three weeks as an umpire with the 26th Division in New York State, I was ordered to duty in G-2 at the War Department, Washington, and closed up my engineering offices in Atlanta and Boston. I found myself in the American Intelligence section working on northern South America. During the year we prepared data on almost all areas in which our troops were later located as part of the hemisphere defense program.

"I was released from service in 1941 and worked on the structural design of the Pentagon Building. Shortly after Pearl Harbor, I was back again at G-2 as a lieutenant colonel. My section was expanded to include the Caribbean area and offshore islands. The situation was very tense during the period of submarine activity. Early in 1942, I flew around the area — Panama, Bogotá, Aruba, Curaçao, Caracas, and Trinidad. After another summer in Washington, I was made a full colonel and sent to Manáos, Brazil, as chief military observer. Later I served in Belém, Recife, and Natal.

"On returning to the States in 1944, I was stationed at Fort Bragg as commander of the Eighth Battalion, Third Regiment, FARTC. During this time I worked in a refresher course at Fort Sill. Alerted in June, 1945, I flew to Honolulu, where my assignment as chief of the construction branch of G-4, MIDPAC, proved most interesting. Policy and roll-up of bases, return of property, new, interim, and temporary construction kept me busy. I returned to Boston in

April of last year and was out of the Army in June. I have been occupied with finding a place to live and getting re-established in my engineering work.

"My wife and I have two daughters, aged 16 and 7. They were with me in Washington, later at Miami Beach, in Brazil, at Fort Bragg, then in Pinehurst, before we went to Honolulu. I had the pleasure of hearing Dr. Compton speak at the Oahu Country Club a year ago. For excitement, I have been dabbling with small plane flying and get quite a thrill out of it. I finished my cross-country solo flight and have a few more hours before getting a private license."

Howard F. MacMillin reports that C. Harry R. Johnson dropped in for a visit at Howard's Chicago office. Harry is general superintendent of the Consolidated Paper Company of Monroe, Mich.

John W. Barriger, 3d, President of the Chicago, Indianapolis and Louisville Railway Company, popularly known as the "Monon," went on public record as ideally equipped to meet the government order in April cutting freight and passenger coal-burning locomotive service by 50 per cent. In a telegraphed reply to the Office of Defense Transportation and the Association of American Railroads which was well received by the press, Jack stated that the Monon's freight, passenger, yard switching, and transfer operations are all dieselized. Not only would all road service continue, but the Monon was ready to expedite any freight or passenger traffic which might be diverted because of the coal strike. Plans were developed for a sharp increase in all schedules to alleviate any serious transportation emergency. The youngest Class I railroad president in the country certainly is having a field day demonstrating what he has accomplished with what even his best friends used to call "the old Hoosier rust streak."

Robert B. P. Crawford has been elected vice-president and a member of the board of directors of Buildice Company, Inc., of Chicago. Bob has been with Buildice as sales manager since last September and will continue in that capacity at the Chicago home office in addition to his new executive duties. The company manufactures industrial refrigeration equipment, ice skating rinks, and coolers for dairies and is a distributor of ammonia compressors for the Worthington Pump and Machinery Corporation. Bob holds some 40 patents on refrigeration, heat transfer, vapor transfer, dehydration, and air conditioning. Before his present association, he served as consulting engineer for the Research Corporation, the Potomac Electric Power Company, the Manger Hotels, the Frick Company, and the M. W. Kellogg Company. He was graduated from Georgia and M.I.T. and is a registered professional engineer and a member of Phi Beta Kappa, the American Society of Refrigeration Engineers, Chi Psi, and the United States Naval Reserve.

The Providence Journal devoted several pages of its illustrated Sunday supplement to a very interesting special article on the experiences of Thomas B. Card of Barrington, R.I., in setting up a program of public works in Saudi Arabia. Aided by excellent pictures taken by Tom, the article tells at some length how he spent almost two years

in planning highways, railroads, power and communications plants, a hospital and special facilities for Jidda, the port of Mecca, where he made his headquarters. Tom came back somewhat affected by the climate and the food, to add to the hard living he had experienced as a colonel in the Corps of Engineers on Okinawa during the war.

See you in Cambridge on June 12. — CAROLE A. CLARKE, Secretary, International Standard Electric Corporation, 67 Broad Street, New York 4, N.Y.

1922

Your Secretary has received additional encouraging news about Al Browning. We quote from Mrs. Browning's letter of April 5, written in Miami: "Al's progress recently seems to have gathered momentum, which buoys us. He had such a desperate fight that it places great caution on his pace, and we are taking things slowly. He was in his oxygen tent eight weeks and has run the gamut of complications, but his spirit has not been dampened, which is a boon." Further information is to the effect that Al will be going back to Detroit about April 22, where he will enter the Ford Hospital for a while before returning to his home in Bloomfield Hills. It is reported that both Brod Haskell and Harry Rockefeller had a chance to see Al for a few minutes.

Harold O. Berry has joined the staff of the Glenwood Range Company at Taunton, Mass., although for the present he is continuing to make his home in Gardner, where he has been for many years. The Newark News of February 19 reports that finance director, Alan W. Hastings, will not seek re-election in the Montclair, N.J., May elections, because of pressure of private business. Hastings is assistant to Laurence Rockefeller, President of Rockefeller Brothers. Congratulations to Buck Eacker, who has just been elected president of the Boston Consolidated Gas Company, which supplies gas to practically all metropolitan Boston. Buck is bearing up under the avalanche of good wishes that have flowed his way. If you have not already read Eric Hodgins' book, *Mr. Blandings Builds His Dream House*, you must go to the movies to see that version, which will soon be at your neighborhood theater. — C. YARDLEY CHITTICK, Secretary, 77 Franklin Street, Boston 10, Mass. WHITWORTH FERGUSON, Assistant Secretary, 333 Ellicott Street, Buffalo 3, N.Y.

1923

I am having a considerable correspondence with men who are planning to be at the reunion later this month. Two men have written that they will arrive by private airplane, and I have heard of three who expect to sail to New London. Harold Bjerke, XV, is coming from Norway and Eduardo Icaza A., IX-B, is coming from the Republic of Panama. Others will hail from practically every point in the United States and Canada.

I have only lately sent out two mailings. One of these is a report on the 25-year class gift which will be presented to the Institute on Alumni Day, June 12. This gift will be at least \$57,000, which is in addition to \$10,000 of these funds allocated to make possible the 1923 Swimming Pool Garden in 1940.

Nineteen hundred and twenty-three was the first of the Institute classes to provide for a 25-year class gift through an endowment insurance plan. It makes it possible for the Class to approach its 25th anniversary in the comfortable position of being able to make a substantial gift to Technology to mark this important event. The report recently mailed will be of particular interest to those who have carried out their commitments in support of the program and wish to see how it worked out. It will be of interest to those who have not been able to support it in the past and those who are not now able to make contributions, such as members of the Class who are located in certain countries with blocked currencies. It is hoped that the mailing may suggest participation to a number of people who to date have not supported the gift plan and now are in a position to do so.

Another mailing is of direct importance to the reunion. If you have not sent in your application blank for reunion reservations, you should get this in as quickly as possible. Write to D. W. Skinner, 529 Chestnut Street, Waban 68, Mass., or telephone him. His business number is KIRKland 7-8930; his home, BIGelow 4-2415. He is handling reservations. Requests for Alumni Day tickets should be made direct to the Alumni Office at Technology.

Personal notes are being omitted this month in order to say that we hope to see you at Technology on Alumni Day, Saturday, June 12, and at the 25-year-reunion of the Class of 1923 at the Griswold Hotel in New London, Conn., from June 13 to June 16 inclusive. — HORATIO L. BOND, Secretary, National Fire Protection Association, 60 Battery March Street, Boston 10, Mass. HOWARD F. RUSSELL, Assistant Secretary, Improved Risk Mutuals, 60 John Street, New York 7, N.Y.

1924

News from Paul Cardinal, who is certainly our runner-up for the biggest and happiest family, is most welcome. Paul took a trip to Boston back in January and of course called on Professor Schell and Olive Barnard. As usual, although Paul has acquired something of that Methusaleh look, bedraggled and slightly shiny on top, Olive called him by name and rank the minute he put his head inside her door. He mentions to me the fact that one of our classmates is now running New Orleans' famous department store but carefully omits all names. Without my crutches here, I cannot give you more information. He makes a good suggestion, that of having Chick Kane conduct a personal tour of all the new buildings at the Institute. Okay, Paul, as ordered, but blow me down, you'd better respond in due style to the Barker's announcements as they are called off.

None other than Colonel Harry Estill materialized in New York last month. Although none the worse for wear, it seems that Harry spent some time on the Continent with the Corps of Engineers. He is now in the manufacturers' agency business in St. Louis. Bill Correale is seen at times in these parts but not enough. Bill Robinson comes in to New York at infrequent intervals, but so far has apparently managed to arrange

enough free lunches not to look me up. But I'll catch him before he knows it. Carl Vicario is carrying on in his own business, known as Clark and Vicario, agents for Nash Engineering, I believe, and is also handling a few other lines that go along with his main project. Bill Keplinger is running the M.I.T. Club outing at the Knollwood Country Club this spring; and so far, it looks like a big success. Anatole Gruhr is still doing big things for Consolidated Edison, and I hear from him occasionally. Pret Littlefield is cussing and sweating away out in southern Connecticut, trying to make a golfer out of himself and always the eternal optimist. Bee Cushman has just bought a place in Darien, and believe it or not, he and your Secretary managed lately to get through the "Pearly Gates" together. Mal MacNaught is very much with McGraw-Hill, after having announced his avowed intentions of opening his own advertising agency.

Your 25th reunion committee, led by George Parker, is making plans and much effort to gather in the shekels for our gift to the Institute. We are far from satisfied with results so far. There is entirely too much complacency on the part of some of us. We have a very nice nest egg to build upon, but we set our goal for \$150,000 and have a long way to go. If only each of you would give a little, and some of you give in accordance with your ability, 1924 could easily break all records. We might not equal or even approach "the mysterious Mr. Smith," but we could make the greatest gift any class has ever made. And we must, we can, we will do so, I feel sure. Cy Duevel had been carrying the load of promoting the donations up until recently, when he had a spell of sickness, and your humble Assistant Secretary was asked to assume the responsibility of continuing the written promotion. Cy is now back on the job, and in the near future you will be hearing from him. Since pinch-hitting for him, your Assistant Secretary has received several personal letters requesting correction of our records. Please do not take it as a personal offense if we should by error put you in the unpaid insurance group when facts show otherwise. Such seeming slight would be due only to the inaccuracies of our list. Just write Cy, me, or the one and only Chick Kane, and we will straighten it out for you.

You'll pardon me for being so inaccurate, but we recently announced the wrong hotel for our reunion in 1949. It's still down on the Cape, but one George Parker gave me the wrong name, and as luck and stupidity would have it, I have left my notes on the new place, at home. In the very near future, however, a card will be going out asking for reservations, with a confirming check, and I assure you that this will give the correct information; also, that there will be no long-winded would-be speeches, such as some of you may remember from many years ago at Marblehead. Not even Bill or George or Nip will undertake such a job. Please send in your check promptly, and if at any time you find you can't be on hand, your money will be refunded (without interest from the Class, although Robinson, Duevel, Barrett, Kane, Marsh, and I will go bail for the amount due). The new place can take care of but 150 men, and the overflow will have

to go into private homes in the neighborhood. But having spent a fair amount of time during the war inspecting gun placements down on the South Shore, I know that we are set for a grand party.

We have heard from Bill Keplinger, Anatole Gruhr, Gregg Shea, Bill Correale, Carl Vicario (indirectly from Pierce Phelps, the Video Artists, or accessories thereto), Estill, Hungerford, and a dozen others whose letters I can't locate, for no good reason other than that I am banging this out from the office at 9:00 P.M., and my efficient secretary is now out with her boy friend (not me either).

Don't forget Alumni Day at the Institute on Saturday, June 12. I had hoped to be on hand, but the Industrial Advertisers Association, my bread-and-butter organization, decided to hold its annual outing at Plandome on the same day, so I have to be there. But I urge all who can possibly make it to attend this reunion and assure you of a grand time.

I still seek news of any description for this column. Won't you please take a few minutes first to make your pledge to our gift fund and then drop me a postal card telling me something about yourself for this column? Thanks, I can use all I get. — FRANCIS A. BARRETT, General Secretary, 234 Washington Street, Providence, R.I. WILLIAM W. QUARLES, Assistant Secretary, McGraw-Hill Publishing Company, 330 West 42d Street, New York 18, N.Y.

1925

During the last two weeks of March, I attended the Purdue Institute for Industrial Personnel Testing, and knowing that Bill Gilliland was on the faculty of the University, I looked him up while there. Bill, who was graduated in Chemical Engineering, has made a career of explosives. During the war, he was in active service, being assigned among other places to Edgewood Arsenal. He also worked on procurement and in Civilian Defense instruction. He returned to civilian life as the war was entering its final stages. Since then, he has done extensive work on a new type casing perforator for oil wells, employing thermit propelled by explosive charges to accomplish the desired results. He has promised to send me copies of papers he has presented on this subject. He was married to the former Lucille Cartmell in 1922 and has three sons and a daughter: Alexis, 16, who came with him to visit me at the hotel, Paul, 15, Walter, five, and Laura, 11.

Last month I quoted a clipping about Ralph Gow sent in by O. B. Denison '11, although I failed to credit him with it. This time there is another, but because of the recent item, I'll omit the biographical data. The Worcester Telegram for March 27 gives the item as follows: "Ralph F. Gow, executive vice-president of the Norton Company, was elected a trustee of Worcester County Institution for Savings for three years at the 120th annual meeting yesterday at the bank."

Here is a clipping from the Staten Island, N.Y., Advance, of March 2: "Visiting as soon as his duties permit will be Milton G. Salzman who recently became a Long Islander. As hydraulic engineer for Ebasco

services, Milton made a 25,000-mile trip to the Philippines for a survey on hydroelectric reconstruction, addressed the 95th annual meeting of the American Society of Civil Engineers on his return, and then left to study conditions in the flooded southlands. He's a Curtis and M.I.T. alumnus and former assistant professor of engineering at Union College. His parents are Westerleigh residents."

Professor Locke '96 sends us the following: "Edward B. Jennings and Mrs. Jennings in a belated report announced the arrival of Edward Payson Jennings, born June 11, 1947."

There has come to me in the mail a model class constitution. As Secretary, I should like to make two requests of the class members. One is, to let me know if any of you are aware whether we already have a constitution. The other is to let me know whether you (a) would like to adopt the suggested constitution or (b) bring our present constitution, if any, into conformity with the suggested one. (It is understood that copies would be made available before such decision would become final.) Please let me know your opinion as soon as possible after reading this. Incidentally, in writing, bring me up to date on your professional and other activities, for inclusion in The Review next fall. — HOLLIS F. WARE, General Secretary, Post Office Box 52, Godfrey, Ill. F. LEROY FOSTER, Assistant Secretary, Room 5-105, M.I.T., Cambridge 39, Mass.

1926

Arthur Johnson returned in mid-April from his three-month round-the-world flight. He reports that he had "a chat with Dave Shepard in London, who looked happy and fairly comfortable with a fire burning in the grate of the fireplace in his London office" and that "in Calcutta, Bill Rivers was a great host to our party." By the time you read these notes, Rivers also will be in the United States. Leaving New Delhi early in May, he flew to London, where he joined Mrs. Rivers, who had preceded him there. They arrived in New York on May 27 in the *Queen Elizabeth* and were looking forward to being at the Institute for commencement and Alumni Day festivities.

The Secretary was interested to see that Irvin L. Murray was a candidate for the National Nominating Committee of the Alumni Association from District 6. He is chief process engineer for Carbide and Carbon Chemicals Corporation in South Charleston, W.Va. — Ralph Smith, who has returned to the United States from Melbourne, Australia, where he had been with the Commonwealth Aircraft Corporation, is now sales engineer for the Aluminum Company of America in Philadelphia. — Ernest Van Blarcom has been elected a member of the program committee of the Montana section of the American Institute of Mining and Metallurgical Engineers. He is with the Anaconda Copper Mining Company.

With much regret we record the death of Thomas L. Gledhill, formerly of Toronto, on July 19. He took his doctor's degree with us in Course XII. — JAMES R. KILLIAN, JR., General Secretary, Room 3-208, M.I.T., Cambridge 39, Mass.

1927

On my way into the office this morning (to dictate these notes), I bumped into Deke Crandell on Rockefeller Plaza. He is still with Liberty Mutual Life in Boston and reports everything under control.

This is very much the season for promotions, and we have quite a number to list. A colossal responsibility now rests on the shoulders of H. W. Fisher, who has been named a director of Esso Standard Oil Company and general manager of their East Coast refineries. The press accounts tell us that Bud now lives at Cranford, New Jersey, and is a member of the Echo Lake Country Club and the Cranford Dramatic Club. He has been with Esso since graduation. — Morgan Collins, after three years as assistant to the president of the General Aniline and Film Corporation, has been appointed director of administrative control of the Lincoln-Mercury Division of the Ford Motor Company. Before his work with Aniline, Morg was with the buying department of Lehman Brothers. — Lawrence B. Grew has been promoted to the position of outside plant and radio engineer of the Southern New England Telephone Company. He will be responsible for the engineering development of all this company's radio activities, including the new mobile services and facilities for Connecticut broadcasting stations and television hook-ups.

The Monsanto Chemical Company has named Alban J. Lobdell as one of four members of the newly formed senior technologists' group in the process section. The function of this group will be to assist active engineering groups throughout Monsanto on new projects, give aid to operating organizations in solving problems, and disseminate technical information. Lobdell was first employed by Monsanto in 1927 as a research chemist in Woburn. He served there and at the company's Everett plant until March, 1946, when he was transferred to St. Louis. — The Rhode Island Hospital has appointed Louis Brega as superintendent of buildings and grounds. Brega has been in construction and maintenance work for many years and was chief engineer officer of the Army Base in Boston during the war. He later served as executive officer for the Corps of Engineers in the First Service Command, attaining the rank of major before his discharge. — We have word from Bernard Y. McCarty, who is assistant director of technical service for the Texas Company, Chrysler Building, New York. His home is at 70 Ridge Road, New Rochelle, N.Y., and he spends summer Sundays at the Larchmont Yacht Club.

Here is a quotation from a recent letter which we were very glad to receive from Fred M. Thomson, 111 Roanoke Avenue, Peoria, Ill.: "I am presently located here with the Byrne-Peoria Communities, Inc., a subsidiary of the Byrne Organization, Inc., of Washington, D.C., builders and contractors, with which company I became connected more than a year ago. We are engaged in the construction of a town, no less — to be known as Marquette Heights — the first increment of which will contain one thousand homes, complete with streets, roads, sewerage system and sewage treatment plant, waterworks system, business

center, and a community center. Ultimate planning visualizes a town of 7,500 to 10,000 population and 2,500 homes. My position in this organization is that of administrative engineer, and don't ask me why the 'administrative.' I can't quite make up my mind whether it sounds better or worse than 'chief engineer.' We are really just getting under way with the project. Already there are plenty of headaches, particularly with the unions. If I'd been smart in my youth, I should have studied brick-laying or cement finishing, then I now could sit back and see who would pay me the biggest bonus or premium for my services. We estimate two to four years being required for this job. My most interesting experience in the past two decades was during the war when, for over three years, I was commanding officer of the Twenty-First Naval Construction Battalion, more commonly known as the Blackjack Battalion of the Seabees. However, that is getting into the past." — JOSEPH S. HARRIS, General Secretary, Shell Oil Company, Inc., 50 West 50th Street, New York 20, N.Y.

1928

Our good President has certainly received a high honor which deserves congratulations from all of us in the Class. We refer to the fact that the newest Tech shell has been named for Ralph Joep. The details of this event were given in a recent issue of the *Winchester, Mass., Star*, from which we quote the following paragraphs: "A new eight-oared shell was presented to the crew of the Massachusetts Institute of Technology on Tuesday evening, April 6, when Harold E. Lobdell, Executive Vice-President of the Technology Alumni Association, christened the shell the 'Ralph T. Joep.' Mr. Joep is well known in Winchester and lives at 7 Chesterford Road. The shell was the gift of Mr. Neal Tourtellotte, a member of the M.I.T. class of 1917, of Seattle, Wash.

"In addition to many officers of the Institute, members of the crew, and a large gathering of students, another prominent Technology figure at the christening was Mr. Henry E. Worcester, class of 1897. The M.I.T. navy also includes a shell bearing Mr. Worcester's name, and another was christened some years ago for Dr. John A. Rockwell of Cambridge.

"Mr. Joep, a Town Meeting member, was graduated from M.I.T. in 1928 and is business manager of the Technology Review and treasurer of the M.I.T. Alumni Association. From 1934 until this year he was a member of the Advisory Council on Athletics at M.I.T. and during that period was active as a leader in Technology sports. He is a native of Portland, Maine, and was president of his class when he graduated from the Institute."

We also extend our sincere congratulations to Al Dempewolff. Al has recently been made advertising manager of the Celanese Corporation. This is wonderful recognition, Al, and we are proud of you!

By the time these notes are being read, the final mailing piece descriptive of our forthcoming reunion at Wianno at Osterville on Cape Cod will be in your hands. May I join with the class committee in hoping that 1928 will have a very sizable turnout at this 20th reunion? I feel certain that

"Come Back to Tech . . ."

you men will have a grand week end on the Cape and will enjoy matching stories and experiences with others in our Class. So far, Paul Johnson and Vic Decorte appear to be the candidates for long-distance attendance at our 20th. As you know, Paul continues to make his home in Honolulu, and Vic is now in Paris. I look forward to seeing you at the reunion.—**GEORGE I. CHATFIELD**, *General Secretary*, 49 Eton Road, Larchmont, N.Y.

1933

Last call for the 15th reunion on June 10 at Osterville! If you haven't already expressed your intention of being there, come along anyway. We can always squeeze in one or two more. It looks like a grand reunion; make it a point to be with us. Meanwhile, here are a few bits of news.

Leo Goodman was recently appointed director of activities in Washington for the United Auto Workers' C.I.O. — **Bill Huston** is the proud daddy of a boy born on March 6. — A note from John King reads in part: "I have accepted the position of chief engineer with the Prepakt Concrete Company of Cleveland, Ohio. This company builds concrete structures by putting the aggregate into the forms first, then pumping in the cement grout separately. The method has a host of advantages, which I had better not get started reciting here. As you may know, I have been with the International Engineering Company as senior engineer on the design of dams and irrigation works for the past two and one-half years." — **Robert M. Love**, President of All American Aviation, Inc., recently announced that aerial passenger service to seven Maryland localities would begin on May 15. During World War II, he was a deputy chief of staff of the Air Transport Command with the rank of colonel. He has been flying since 1929 and has logged about 4,000 hours. — **Elna I. Perkins**, who has served as executive secretary of the Greenwich, Conn., Tuberculosis and Health Association since March, 1946, has resigned that position, to accept a post as health educator with the New York State Food Commission in Syracuse, N.Y.

Tucker Vye has recently been chosen administrator of the Addison Gilbert Hospital. He was previously employed in several departments of the Norfolk County Hospital in Braintree and became assistant administrator there. He will be the first administrator by that title at the Winchester Hospital, replacing superintendents who have been nurses. He is married and the father of one child. — A memo from **Charlie P. Woods** states that after a number of years with Dun and Bradstreet he has gone into business with **Cornelius du Bois and Company, Inc.**, specialists in market and opinion research. The particular specialty is Media Research. — **GEORGE HENNING, JR.**, *General Secretary*, Belmont Smelting and Refining Works, Inc., 330 Belmont Avenue, Brooklyn 7, N.Y. **ROBERT M. KIMBALL**, *Assistant Secretary*, Room 3-208, M.I.T., Cambridge 39, Mass.

1934

Wilbur P. Foote has taken an engineering position with the Bristol Company of Waterbury, Conn., makers of industrial instru-

ments. As the company's Seattle, Wash., representative, he will cover Washington, Oregon, Idaho, Montana, and British Columbia. Before going to Seattle, he made his home in Laurel, Mont., where he has been a sales representative for the Laurel Trading Company since October, 1946. From 1940 to 1943, he was with the Bristol Company in the San Francisco and Los Angeles offices and was purchasing agent at the Waterbury factory. He left the company in August, 1943, to enter the Navy as a lieutenant in aviation ordnance, upon his discharge, after three years of service, he went to Montana.

W. P. Overbeck is among six administrative aides who have recently been appointed to help in the operation of General Electric's nucleonics project. This program, which General Electric is operating on behalf of the Atomic Energy Commission, includes operation of the Knolls Atomic Power Laboratory and of the Hanford works in the state of Washington, where plutonium is made. In 1943, he joined the Clinton Laboratories at Oak Ridge, Tenn., then went to Hanford in the employ of the Du Pont Company in 1944 as a technical specialist on instrumentation. Later, he was made superintendent of the plant instrument department, and when General Electric took over its operation, he was appointed works engineer. He will now have general supervision over all engineering matters.

Norman B. Krim writes to let us know of a new arrival in the family, **Robert Mitchell Krim**, born on March 17. He says, "Bobby is our third boy. Arthur is going on five and Donald is two and a half. I married **Beatrice Barron** of Cambridge in May of 1942. I have been with Raytheon since I left Technology in 1935 after a year of graduate work. I have been manager of the special tube section since 1939 and have recently been made division manager of radio receiving tubes. I often wonder what ever became of **Graves Snyder** of V.I.C." — **JOHN G. CALLAN, JR.**, *General Secretary*, 184 Ames Street, Sharon, Mass. **ROBERT C. BECKER**, *Assistant Secretary*, Chile Exploration Company, Chuquicamata, Chile.

1937

Now that "the voice of the turtle is heard in our land" and the sap is beginning to run in some of you old graduates, 11 years out, perhaps we shall hear from more of you.

Vic Kron, who deserted engineering and is now an M.D. in Gary, Ind., writes in part: "Some time ago I'm sure I announced that I was dropping engineering for medicine, a matter of much interest to almost everyone who finds it out, apparently, because they always ask why. Also about that time I got myself a wife—the same girl that I took around in Boston. I struggled through five more years of school, the extra year being necessary because the medical school authorities couldn't be convinced that a mechanical engineering degree from Technology was proper pre-med training. My next move was to go to Johns Hopkins in Baltimore for an internship, before the Navy stretched out its long arm and snared me for duty aboard a destroyer bound for the Pacific, where I did a phenomenal job of bunk duty and rolling with the sea, first as part of the Halsey

crowd and later as part of the occupation force of Japan and the Pacific. Somehow, in the confusion of postwar rehabilitation, I dropped in on Gary, and as the months settled by, I found myself settling down and liking the town, that being an unheard-of reaction, if you know anyone who knows Gary. I have been here about a year and a half now, at first in practice with one of the older doctors, but now in the process of establishing my own."

Harry Metz was recently appointed in charge of the Burro Mountain branch of the Phelps Dodge Corporation, Tyrone, N.M. And from the Southland, it is heard that **Walter Regnery** has been named general manager of the Joanna Cotton Mills Company, Goldsboro, S.C.—**WINTHROP A. JOHNS**, *General Secretary*, 34 Mali Drive, North Plainfield, N.J. **WALTER T. BLAKE**, *Assistant Secretary*, Research and Products Development, Pillsbury Mills, Inc., Minneapolis 2, Minn.

1938

The Chapel of the Redeemer at Fairway Hills, Md., was the scene of the wedding, at noon on March 6, of **Aurelia Katherine Hutchison** to **William Thomas Shuler**. Bill is now an aeronautical engineer with the Civil Aeronautics Administration in Washington, D.C. Although he was graduated from Roanoke College, Bill got his master's degree with us. — On February 29, Mr. and Mrs. **Herman Hollerith** of Baltimore, Md., announced the engagement of their daughter, **Sally**, to **H. Erich Nietsch**.

Charlie Maak writes from Burbank, Calif., that he has returned to his old firm of Menasco, working on metallurgical problems in the construction of the atomic energy air gravity propulsion unit. He spent three months at Oak Ridge, Tenn. While he was there, his new baby boy arrived, making the second addition, the older boy now being four years old. **Charlie** is now planning to go to work for Lockheed Aircraft.

You should get these class notes a few days before our big 10th reunion at Plymouth, Mass., from June 10 to June 12. If any of you have not yet decided to join us, this is your last chance to make up your mind and get in on the fun—and it really is going to be good! You can send your reservation to either **Louis Bruneau**, 150 Broadway, New York City, or **Albert Wilson, Jr.**, 32 Bertwell Road, Lexington 73, Mass. See you all soon! — **DALE F. MORGAN**, *General Secretary*, Carbide and Carbon Chemicals Corporation, 30 East 42d Street, New York, N.Y. **ALBERT O. WILSON, JR.**, *Assistant Secretary*, 32 Bertwell Road, Lexington 73, Mass.

1939

Al Copp reports that he is still with the Aluminum Company and in exploration work but that he is at present in the New York office. **Al Miller**, whose address as consulting engineer is now 132 St. James Street, West, in Montreal, reports that business conditions in general were very good during the past year in Canada but that mining has been about so-so. **Al** has tended to shift away from mining and get into industrial work. **René Martin**, a classmate, continues to work with **Al** as erection superintendent. During a recent month they put

up 26 buildings, including a number of large warehouses for the paper and pulp corporations. Of late, they have been doing a little contracting work for the government on roads.

We wish to extend deepest sympathy to the family of Warren Blake Goddard, whose father recently wrote as follows: "I am not sure whether or not you have heard of the death of my son, Warren Blake Goddard, '39, and so I am writing this brief death notice for *The Review*. Warren was born in Urbana, Ohio, and died in Boston, Mass., on August 24. He received a B.S. and M.S. in 1940 and immediately took a position with the General Electric Company. In September, 1941, he was one of the 'five key engineers' chosen to develop the jet-propulsion engine. At the time of his decease, he had charge of the section of the aircraft gas turbine engineering division of the General Electric Company at Lynn, Mass., which handled all problems dealing with stress analysis, materials, and thermodynamics. While at Technology, and later at Lynn, he was known as 'Rocket' Goddard. He was unmarried."

Tsun-Ming Wang, who is professor of metallurgy in the department of mechanical engineering of the National Tsing Hua University of Peiping, China, writes that at the moment he is the only one teaching metallurgy in the former capital of China. He has 250 students from two national universities attending his classes. The university has allowed him for this year six thousand (United States) dollars to purchase equipment, and also the two ministries of the government have boosted his research budget by one-third of a billion Chinese dollars. How much is that? — A brief word tells us that Evan Pancake has been transferred by the Texas Company Research Laboratories from Shreveport to Bellaire, Texas.

We hear that Mike Herasimchuk spent a pleasant three weeks' vacation in South America this past winter; Mike has been elected secretary of the newly formed M.I.T. Club of the Lehigh Valley. Is anyone anxious to hear more about the 10 days in Rio? — Morrie Micholson, having received his doctor of science degree in physical metallurgy from Technology last June, is now research engineer in the engineering research department of the Standard Oil Company (Indiana.) His principal interests are concerned with engineering materials used in petroleum refining.

From the clipping bureaus come the following items: Helen McConnell became the bride of Frank Spooner, and they are residing at 1000 Magie Avenue, Elizabeth, N.J. Likewise, John Shimer has been married since the fall to Genevieve Vaughan-Jackson of Berkhamsted, Hertfordshire, England; John is now assistant professor of geology at Brooklyn College. George Moore recently became a partner with Dan J. Malarkey, Portland, Ore., general contractor, under the firm name of Malarkey and Moore. George was associated with construction firms in Los Angeles, San Francisco, and Alameda, Calif., joining Malarkey's business in 1946 after four years with the United Engineering Company of Alameda. Ed Usher is engaged to Jean Whitney Raymond of Upper Montclair, N.J. Ed, after "majoring"

in the Army Air Forces for four years, is now a project engineer with the Allen B. Du Mont Laboratories, Clifton, N.J. Dr. Jerome Gross's engagement to Betty Ruth Bloch has been announced. Jerry was with the Army Medical Department in Europe and Asia as a captain for three years and is now a research associate with the Department of Biology at M.I.T.

From the "Course VI-A News," we learn that Clint Lawry is working on the development of control circuits in the marine and aeronautics division of General Electric.—Francis Sargent was appointed director of the State Division of Marine Fisheries but according to the *Boston Post*, a slight hitch occurred in the payroll department and there seemed to be no money in the budget for this particular job, unbeknownst to our classmate. The rest of the story has not come through the wires as yet but the original headline was good: "HAS FINE STATE JOB BUT NO PAY."

We're hoping to see a better '39 turnout at the forthcoming Alumni Day festivities and herewith submit a gentle reminder that one—yes, just one—letter guarantees a column.—STUART PAIGE, General Secretary, 701 Mill Plain Road, Fairfield, Conn. ROBERT C. CASSELMANN, Assistant Secretary, 271 Cypress Street, Newton Center 59, Mass.

1940

John G. Leschen is one of the new research associates to be added in recent months to the metallurgical section of the General Electric Company's research laboratory. Mr. Leschen pursued his graduate work in physical metallurgy for three years after graduation with our Class and then was connected with the National Research Corporation in Boston for two years before going to Schenectady. — C. A. Stokes is director of research and development at Godfrey L. Cabot, Inc., in Boston. He recently spoke to the Akron section of the American Institute of Chemical Engineers.

Dorothy Anne Bristow and Thomas Stewart Harris, Jr., were married on February 28. — Judith Mandell and John L. Danforth were married on March 13.

We get mighty disgusted with the Class of 1940 when we realize what a vast amount of experience has been accumulated in the last seven years and what interesting episodes have occurred to members of the Class as a whole—and then compare these with the "news dribbles" that finally reach your Secretary to be included each month in *The Review*. What has happened in your life? Where are people like Wight, Wiley, Woodward, Thomas, Taylor, Tuttle, Tougas, Ross, Rumsey, McCabe, McDonnell? And besides hundreds of others, there is deOlloqui—this is not the first time he has been paged by this writer.—H. GARRETT WRIGHT, General Secretary, Garrett Construction Company, Post Office Box 629, Springfield, Mo. THOMAS F. CREAMER, Assistant Secretary, 6 Berkley Road, Scarsdale, N.Y.

1941

Les Corsa is recovering from a short illness and will soon be visiting a few classmates in Washington and Philadelphia in the company of "the one." "I had a pleasant visit,"

he says, "from Pete Gilmer and joined the weekly M.I.T. lunch with Pete, Mart Mann, Bill Kussmaul, and Bob Kraus '42 in New York. Pete is with the Bell Telephone Laboratories; Mart is an associate editor of *Popular Science*; Bill is a salesman for General Chemical; Bob is writing for McLaughlin-Carr Associates, Vern Kyllonen '40, was married to Louise le Blanc on February 14."

We are pleased to report the marriage of Ivor Collins to Shirley Rhea on April 7 in Schenectady. Shirley's dad, T. Richard Rhea, is a member of the Class of '24, Course VI. Ivor reports as follows: "We had quite a gang at the wedding, and all went off smoothly, though I rattled a bit at crucial points—didn't drop the ring or anything, however. Joe Quill of VI-A and track fame was on hand. He works for Shirley's dad, and I see him quite a bit around the works (G.E.) and at M.I.T. Club meetings. While down that way, we took a side trip to Baltimore to see Dot and Bill Fox and Dianne, now aged two. Bill is still getting around on crutches but puts in 30 hours a week at the Sparrows Point Shipyard. Stevie and Irv Foote came over. Irv reports a card from Frank Walker and wife postmarked 'Miami.' We had a telegram from Helen and Carl Aronsen; they're still in San Francisco."

The following men who have received the degree of B.S. during the last year are affiliated with our Class: Dick Knapp, Bob Katz, John Bone, and John Stadig; those lately receiving the degree of M.S. are Matthew Relis, Michael Costagliola, William Hope, and Stanley Backer.

Louise Petterson is to be married in July to Ed Bishop. Louise is an alumna of Western Reserve University and a chemist at Westinghouse. Priscilla Haas was married to Rog Blum in March. Priscilla was graduated from the George School in Bucks County, Pa., and from Smith College in 1945. Anne Grant became Mrs. Austin Fisher in February. Anne is a graduate of Simmons. Suzanne Carreau is engaged to Carl Mueller, perhaps married by now. Adele Benziger was married to Richard Markey in Summit, N.J., early in April. Serena Simons was married to Alex Leonhardt on April 1. Serena is a Smith alumna and served overseas with the Office of Strategic Services during and after the war. Alex was a lieutenant commander in the Naval Reserve in the Pacific area during the war.

We received an interesting clipping describing the 100 years of business of the Joshua Conner leather goods company in Wilmington, Del. The fourth generation of the Conner family, Joshua, Jr., is affiliated with the Class of '41. A similar account of family enterprise was given in a recent issue of the *Saturday Evening Post* about the Storey Boat Yard of Essex, Mass., building for the fishermen on both sides of the Atlantic.

We have received the very sad news of the death of Bob Franz on February 25 and wish to extend our sincere sympathy to his family. Bob entered the Institute from Phillips Academy and received his B.S. in 1941. During the war he served as a lieutenant commander in the Naval Reserve and for the past two years had been employed by the Eastman Kodak Company. Bob is survived

by his wife Alice and two sons, John and Thomas, his parents, Mr. and Mrs. Robert Franz of Andover, and his brother George. —STANLEY BACKER, General Secretary, 101 Providence Road, Primos, Pa. JOHAN M. ANDERSEN, Assistant Secretary, Saddle Hill Farm, Hopkinton, Mass.

1944 (2-44)

Dave Jealous was down in Boston recently on a business trip, and I was able to see him for a short while. He seems to be enjoying his work at General Electric in Schenectady, N.Y. Dave tells me that several A.T.O.'s of the Class of '44 are having a little reunion on May 1 in Boston. A note from Bernard Rabinowitz reports his engagement to Ann Kubie of Radcliffe and New York City. Bernie is now occupied manufacturing dye-stuffs for the Atlantic Chemical Corporation, of which he is the vice-president in charge of production. It looks as if Bernie were doing all right for himself. John Flanagan is to marry Carlotta Busch on June 21 in St. Louis, Mo. Carlotta went to the Mary Institute in St. Louis and was graduated from the Shipley School in Bryn Mawr, Pa. She made her debut in the summer of 1945.

Latest changes of address: Gunther Baldauf, Boston, Mass.; Pei Chao, Lowell, Mass.; Dean Dragsdorf, M.I.T.; George Funk, Eureka, Calif.; John Gardner, Seymour, Conn.; Albert Hess, Chicago, Ill.; Raymond Jerome, Cranston, R.I.; Richard Lettan, Peekskill, N.Y.; Han Liu, Shanghai, China; Robert Maher, Tulsa, Okla.; Ilhan Sezer, Ankara, Turkey; Helen Spence, East Lansing, Mich.; Thor Thorsteinsson, Grand Forks, N.D.; Joe Ullman, Buffalo, N.Y.; Page Ufford, Penns Grove, N.J. —WILLIAM B. SCOTT, General Secretary, Mellon Hall, C-41, Harvard Business School, Boston 63, Mass. MALCOLM G. KISPERS, Assistant Secretary, Room 3-243, M.I.T., Cambridge 39, Mass.

1945 (6-45)

Your Secretary apologizes for the lack of notes in the recent issues of The Review and promises that the future will produce better results. Ed Stoltz, who is enjoying his position as sales representative in the Baltimore area for the Johns-Manville Sales Corporation, has offered to help start a correspondence campaign among the members of the Class. Ed is active in the M.I.T. Association of Baltimore. If any others are interested in this sort of activity, I should appreciate their getting in touch with me.

George McKewen has been enrolled in the General Electric sales management training course and has spent time at the Telechron plant and at Trumbull Electric in Connecticut. Jim Brayton is employed with the Turner Construction Company and is now working on the new John Hancock building in Boston. Jim Hoagland and family are also in Boston. Jim is with the Minneapolis Honeywell Company and enjoying the work very much. Bill McKay is with the B. F. Sturtevant Division of Westinghouse and is involved in the sales of the Precipitron units. Kirk Drumheller has gone up the river to Harvard Business School. Clint Springer is also in the construction business in Providence. Nick and Rosemary Mumford are the proud parents of Nicholas van S. Mumford, 3d. Nick is with Chance-

Vought Aircraft Company in Hartford. At Gerry MacKinnon's wedding to Nancy Joy Williams, I met Bruce Hildebrand, who has recently become engaged to Virginia Ferguson of Lexington. Bruce is now studying for his master's degree in Aeronautical Engineering. I also learned that Walter O'Connell and Louise Clough had announced their plans to be married on May 1. Walt is in air-conditioning in Bethlehem, Pa.

Catching up on recent marriages, we find the following: Jason Levine to Rosalind Leavitt, in Boston; Robert Maglathlin to Eleanor Chadwick, in Bridgewater; Elliott W. Reed to Patricia Ann Tierney, in New York City; Norman Kennedy to Janet Parmelee, in Stratford, Conn. (Norman is a meteorologist with the Northwest Airlines in Seattle); Richard Winkler to Elsie Littlefield, in Ogunquit, Me.; James C. Pond to Georgia Favour, in Manila; Bill Farrow to Marion Cummings, in Natick, Mass.; Walter Borden to Margot Fenn, in Concord, Mass.; Hartmann Kircher to Blanche Borkstrom, in Orange, N.J.; David Clare to Margaret Corcoran, in Waban, Mass.; Alfred Oxenham to Louise Leslie, in Beverly; Ralph Scherer to Joan Keir, in Framingham, Mass.; Marshall Schober to Tina Anderson, in Annandale, N.Y.; William Pasfield to Fairlie Maxwell, in Germantown, Pa.; Dwight Collmus to Serene Quynn, in Frederick, Md.; Alvin Cohen to Devara Birger, in Boston; Frieda Omansky to Dr. Felix Cohen, in Boston; William Symonds to Marilyn Groff, in Marblehead, and Donald Walsh to Faith Harvey in Glen Ridge, N.J.

I, also, am married, to Janice Meyer of Fall River, and am now with the Doelcam Corporation in Newton, Mass., doing development work on gyroscopic devices. I should like to hear from you and learn what you are doing, too. —DAVID P. FLOOD, General Secretary, 57 Beech Street, Framingham, Mass. THOMAS A. HEWSON, Assistant Secretary, Hartford Street, Dover, Mass.

1946

You have probably all heard by now that Bob Cohen married Lorraine Samuels in January of last year in a ceremony at the Starlight Roof of the Waldorf-Astoria. Bob is working in New York for the Simon Cohen Company and living in East Rockaway. Also your Secretary is a little late in announcing the birth, but right on time for the first birthday, of Cary Eaton Maynard, daughter of John and Jan Maynard. John is out of the Navy and working for the Doelcam Corporation (along with Ken Mathews) out at Newton Corner. The Maynards are homeowners now, having staked their claim to a portion of Winchester.

Word has reached us from hither and yon of the marriage of Gene Ryan and Irene Mary Millar of Philadelphia in that city on February 7. Gene is stationed on the U.S.S. Palau attached to the Norfolk Navy Yard, although he has spent some time in Maryland studying radio. Lewis Lees, who was connected with our Class while at the Institute, married Kathleen Louise Anderson of Rochester in December. Peter Hagerty and Dorothy Marie Lucking of Easton, Pa., were married in New York in February. Pete got his master's degree last September and is now working for Eastman Kodak in

Rochester. Before returning to China, two of our Chinese navy officer classmates, Tsu-Wen Liang and Yu Hu Yeh, married daughters in the Chin family, Jane and Anne respectively.

Recent engagements include those of Harold Oakes and Elizabeth Kendrick of Brookline; Bob Campbell and Doris Elaine McLetchie of Melrose; Ted Church and Shirley Ruth Barry of Lexington; Dick Krahe and Juanita Roop of Cambridge; and Alan Gruber and Harriet Charlotte Mandel of Brooklyn, N.Y.

A letter from Larry Body begins by saying that nothing is happening to him and then goes on to describe a journey all over the globe to catch a ship (the U.S.S. Spokane) he'd received orders to join. At the time of the letter, Larry was returning to the States to wait for a flight-training application to pop and to check marital plans scheduled for this spring. Another ensign contemplating flight training, H. A. Gray, who is now attached to the U.S.S. Allagash making oil runs to the Mediterranean, tells us of a third ensign, John Whitehead, who has begun flight training in Texas.

In the field of education a number of classmates are to be found as pedagogues. Walt Backofen is teaching metallurgy at the Institute and also studying for an advanced degree, on receipt of which he predicts he'll retire to some "inexpensive sanitarium." Jim Goldstein, we understand, has finished advanced work in Building Engineering and Construction and is also now an instructor at the Institute. Ed Byrkit is on the civil engineering staff at Dartmouth's Thayer School. Teaching physics are John Dudley and Mel Levine; John at the University of California at Berkeley, and Mel at Pennsylvania State College. John Fleming is an instructor in industrial engineering at the University of Pittsburgh, and Walt Sauter is giving his all at Cornell. At Lowell Textile Institute, Ernest James is teaching analytical chemistry, and Carl Nelson is giving part-time instruction in mathematics at the University of Delaware. Ai-ting Yu is working at the Fritz laboratory at Lehigh and studying for a Ph.D.

Upholding industry here and there are Beverly Beane in the research department of United Aircraft; Jerry Gumenick for Wesley-Freeman in Baltimore; John Gritzan for the Erie Railroad; Deane Folsom for another railroad, the New York, New Haven and Hartford; Ted Eliades for the Barry Corporation in Cambridge; Morris Chomitz for Allied Chemical and Die in their Barrett Division; Andy Burns for the Borden Corporation in Danbury, Conn.; Bob Ebisch and John Blooman for General Electric. —JAMES S. CRAIG, General Secretary, Morris Hall D-41, Harvard Business School, Boston 63, Mass.

1947

Not long ago I received a very interesting air-mail letter from the American Occupation Zone of Germany. It contained the announcement of the engagement of Hank Lee to Ria-Christina Gerhardt of Bayreuth and was unusual in that the announcement was in German on one side and English on the other. Hank didn't supply any de-

tails, but he did include his address, which is care of Captain H. L. Lee, Headquarters, Wetzlar Military Post, A.P.O. 169, in care of Postmaster, New York City. Dan Cupid seems to be as energetic as ever, for many of our classmates are succumbing to the uncanny accuracy of his bow and arrow.

Word comes of the engagements of Dick Wildermuth to Edith Amanda Betts of Old Greenwich, Conn.; of Howie Grant to Marion Jeannette Beaton of Roslindale; and of Bob Gluckstern to Norma Block of Mat-tapan. Bob, by the way, is still at the Institute, grinding away on his Ph.D. Johnny Taft and Nancy Sawyer Jacocks of Bran-ford, Conn., are planning an early summer wedding; and Hank Lurie has given a ring to Virginia Alice Stix of Cincinnati. Bob Musser, who is now with Union Carbide and Carbon Corporation, is engaged to Marilyn Keach of Providence; Jim Stotter, to Patricia Jacobs of New York; and Rufe Scherer, now employed as an industrial engineer with the Hathaway Manufacturing Company of New Bedford, is engaged to Marilyn Lucille Lovell of Worcester.

Frank Schwoerer and his betrothed, Lois Katherine Green of Annapolis, are planning their nuptials soon; Jim O'Neill and Ursula Frances Neary of New Bedford have set a June date. Mort Levine married Jean Ryack of Roxbury in February, and the couple are now making their home in Virginia. Also a February wedding was that of Vic Dawson to Marguerite Mary DeLuca of Stoughton. Vic has a position with the department of research of the Carrier Corporation in Syracuse, N.Y., where he and his bride now live.

By way of Charlie Locke '96, comes some interesting news on Bob Kamm's adjustment to life down under. As I reported in the last notes, Bob is on the staff of the school of metallurgy of Melbourne University, and

he and his wife sailed under the Golden Gate Bridge for the southern Pacific in January. After visiting Suva, Fiji, and Auckland, they finally arrived in Sydney and flew from there to Melbourne. Bob has had little difficulty in becoming accustomed to English currency and left-hand driving, but shortages in meat, clothing, and gasoline are not so easy to get around.

A few weeks ago, I bumped into Jack Harvell up in the new lounge bar in Pritchett Hall. Up until that time, Jack had been working as a test engineer at the Schenectady division of General Electric but has since been transferred to Lynn. In Schenectady, Jack had been living at the University Club with Dave Jealous '44, and recommends it as a fine place to stay.

Out at the Wellesley Winter Carousel, back on February 21, I met Bill Bursnall, who was combining business with pleasure. He's been looking into the possibilities of coming back to graduate school either here or at Harvard, and coincidentally was having a great time. — Danny Carnese came up to Boston for a week-end visit and had many fine things to say about his job as an aerodynamicist with the Piasecki Helicopter Corporation of Philadelphia. He also reported that his old friend Vin Goddard is teaching aero lab and doing research at Notre Dame.

Pieter Schoonhoven has been working with the E. B. Badger and Sons Company of Boston for some time, and I managed to collar him over in the dorms some time ago while he was visiting friends, and got him to tell me a few of his plans. He says it is all very indefinite, but if things work out he should be quite the traveling man. He hopes to be sent down to work on a company project in Texas for a year, and then on to the company holdings in Palestine and his home, The Netherlands. It sounds like quite an exciting future.

Ed "Killer" Kane routed me out of bed one Saturday morning to let me know that he was still his old self. He has a position with the Ontario Paper Company, of Thorold, Ont., and bears the high-sounding title of process improvement engineer. Modestly, Ed told me that he was still single but had barely escaped twice. He was a veritable gold mine of information about the doings of other classmates. Old friend George Katz is in the executive training program with Sears, Roebuck in New Haven; and Lee Hanower is with the Standard Oil Company in Elizabeth, N.J. Watt Webb is with Union Carbide and Carbon in Niagara Falls, and Ed tells me he is still as interested as ever in his sailing. Ed also reports that Watt has joined a group known as the Young Professionals whose interests are many and varied. Also in Niagara Falls is Barry Brown, another Course X man, who has a position with the Hooker Electrochemical Company; and Phil Perch is at the Toronto division of National Analine of Buffalo. By the way, Ed wants it known that his company is the one supplying newsprint to the Chicago Tribune and the New York Daily News.

Don Graham, who is working on a thesis on mass transportation here at the Institute, has accepted an appointment with the Providence redevelopment agency to do work on parking and traffic problems. Mel Salveson, one of Course XV's products, has joined the New York staff of McKinsey and Company, management consultants. I received a card from Ed Sadowsky saying that all is well with him and that he and his wife are now living in Passaic, N.J.

I am sorry to have to report the death of Harry Duane Campbell, an ensign, who died in the service of his country on February 16. No other details are available.—CLAUDE W. BRENNER, General Secretary, Box 406A, Graduate House, M.I.T., Cambridge 39, Mass.

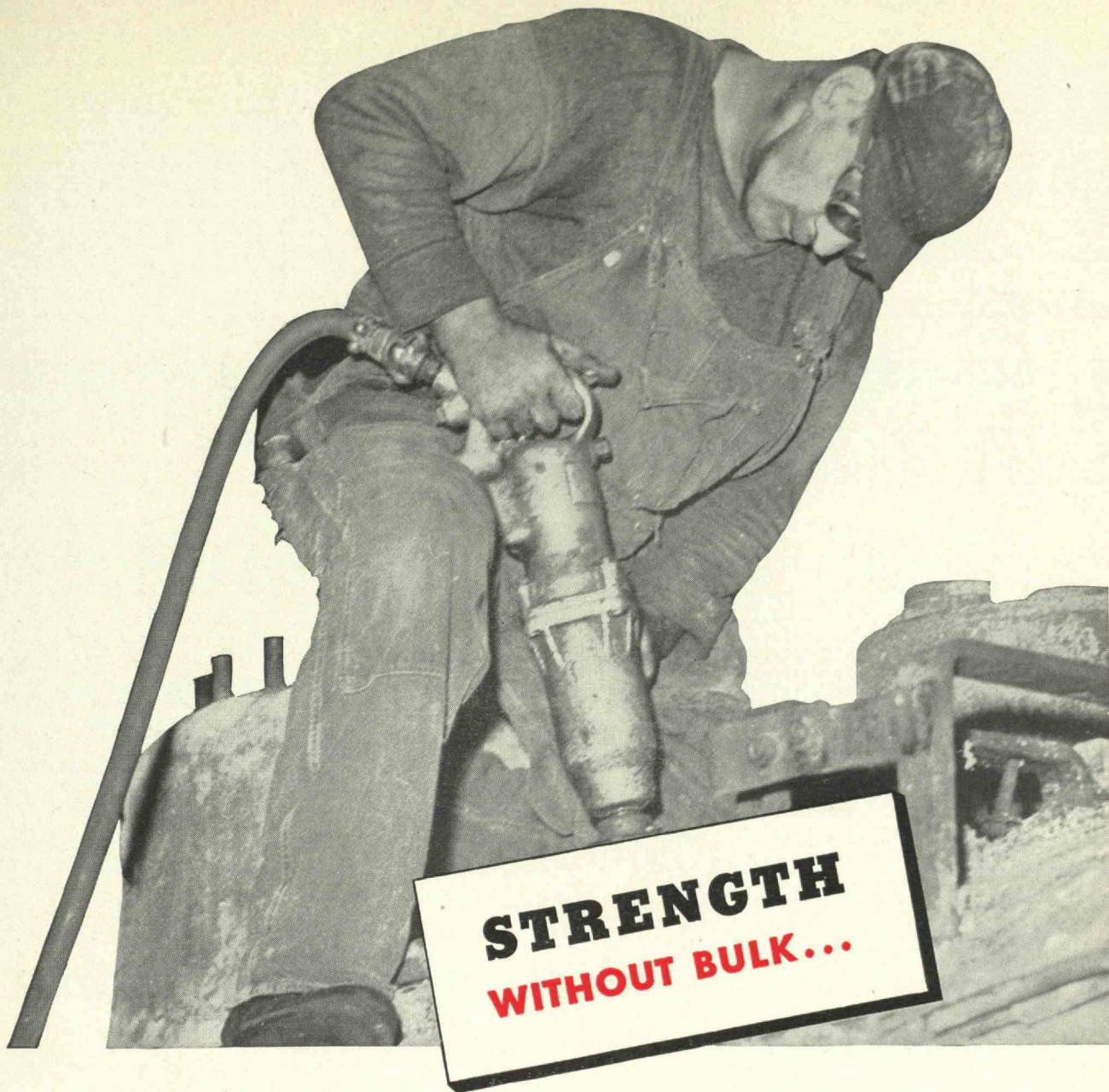
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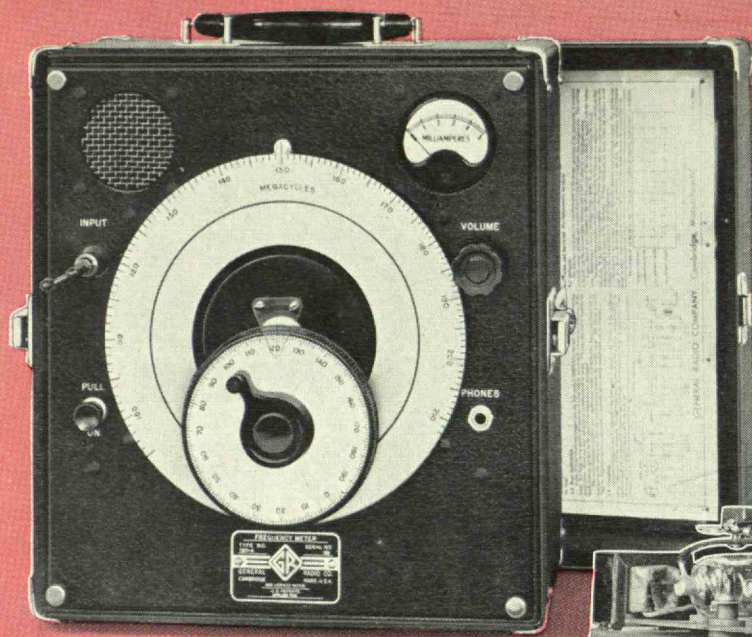
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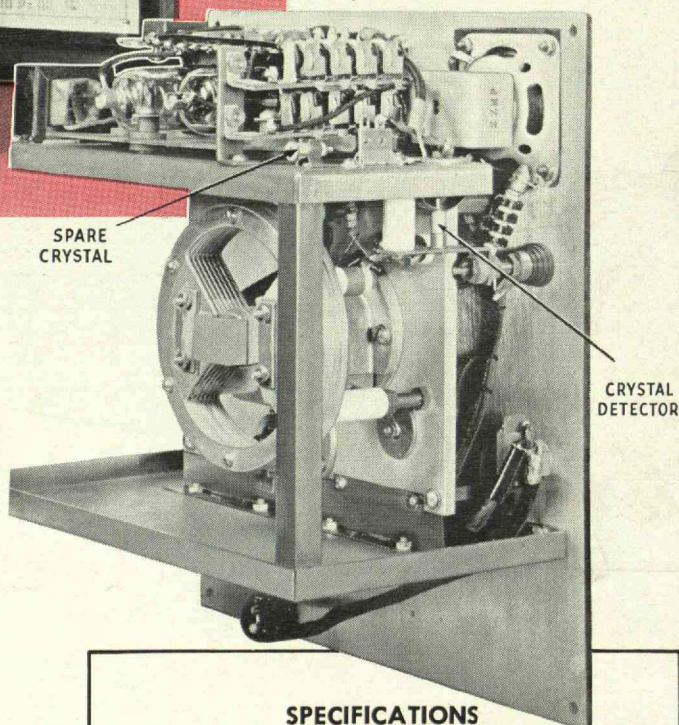
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